

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

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Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

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INDEX FOR VOL. XXV.

The 8-page Index for Vol. XXV of "Flight" and "The Aircraft Engineer," January to December, 1933 (with over 7024 references for "Flight" and 197 references for "The Aircraft Engineer"—7221 in all), is now ready and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C.2, price 1s. per copy (1s. 1d. post free).

EDITORIAL COMMENT



R. BERNARD SHAW is the greatest jester of our age. He can reduce the most serious subject to ridicule with an air of the most profound wisdom. Like Jack Point, however, he might say: "Oh, winnow all my folly and you'll find a grain or two of truth among the chaff." So, in his broadcast *causerie* the other evening, under the title of "Whither Britain," Mr. Shaw took the idea of air bombing, which General Groves and those of his supporters are trying to popularise, and treated it to a dose of common sense disguised as nonsense. It will be useful to recall his exact words. "Are we to be exterminated," he asked, "by fleets of bombing aeroplanes which will smash our water mains, cut our electric cables, turn our gas supplies into flame-throwers, and bathe us and our babies in liquid-mustard gas from which no masks can save us? Well, if we are it will serve us right, for it will be our own doing. But let us keep our heads. It may not work out in that way. What will London do when it finds itself approached by a crowd of aeroplanes capable of destroying it in half-an-hour? London will surrender. White flags and wireless messages 'Don't drop your bombs; we give in' will fill the air. But our own squadrons will have already started to make the enemies' capitals surrender. From Paris to Moscow, from Stockholm to Rome, the white flags will go up in every city."

That is how the arch-burlesquer naturally would put it. It would have spoilt his joke to have suggested that the wireless messages might arrange for a

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1934.
- Feb. 16. Bristol and Wessex Ae.C. Annual Ball, Grand Spa Hotel, Clifton.
 - Feb. 16. De Havilland Technical School Annual Ball, Stag Lane, Edgware.
 - Feb. 21. "Development of Aircraft and Its Influence on Air Operations." Lecture by Sq. Ldr. R. V. Goddard before R.U.S.I.
 - Feb. 22. Herts and Essex Ae.C. Annual Dinner and Dance, Wharnclyffe Rooms, Hotel Gt. Central, London.
 - Feb. 23. British Gliding Association Annual General Meeting, at R.Ae.S.
 - Feb. 24. No. 10 Sqdn. R.A.F. Reunion Dinner.
 - Mar. 1. "Speed and the Economics of Air Transport," Lecture by Maj. F. M. Green before R.Ae.S.
 - Mar. 2. Norfolk and Norwich Ae.C. Annual Dinner and Dance, Arlington Rooms, Norwich.
 - Mar. 6. "Relation of the Molecular Structure of Fuels to Their Behaviour in Diesel Engines." Lecture by G. D. Boerlage before R.Ae.S.
 - Mar. 15. "Some Developments in Aircraft Construction." Lecture by H. J. Pollard before R.Ae.S.
 - Mar. 21. "Some Problems of a Technical Service." Lecture by Wing Com. G. W. Williamson, before R.U.S.I.
 - Mar. 24. Services Rugby: R.A.F. v. Army, at Twickenham.
 - Apr. 5. "Engines." Lecture by Capt. A. G. Forsyth before R.Ae.S.
 - Apr. 12. "Speed and the Future of Commercial Aircraft." Lecture by M. Louis Breguet before R.Ae.S.
 - Apr. 26. "Landing in Fog." Lecture by Dr. Rüd Stüssel before R.Ae.S.
 - Apr. 27-May 6. International Aero Show, Geneva.
 - May. Wilbur Wright Memorial Lecture, before R.Ae.S.
 - May 26. Heston Air Navigation Trials.
 - June 30. Royal Air Force Display, Hendon.

mutual withdrawal of the respective bombing forces so that each capital should survive. But, when we winnow all the folly we find in Mr. Shaw's grotesque picture the same truth which Marshal Foch expressed to Lord Mottistone, when he said that if the French air arm could destroy London, so could the British air arm destroy Paris, and, therefore, neither would happen.

No one does any good by trying to make our flesh creep with pictures of the worst that unrestrained armed power might work on the defenceless. Frightfulness is an old story, and as a means of beating a virile nation to its knees it is a discredited device. Londoners may get a useful lesson in its futility by visiting the little gardens on the Embankment, just west (or, strictly speaking, south) of the Houses of Parliament. There they will see the group of statuary by Rodin representing the Burghers of Calais. Probably most Londoners will remember the story, how Edward III decided to punish the town for heroically resisting his arms, and so accepted the surrender only on condition that the leading citizens came out with halters round their necks ready for him to hang them. This was intended to frighten other towns which he might besiege into swift surrender—a particularly gross case of frightfulness. That the English Queen begged off the brave citizens has nothing to do with the moral of the story. That moral is, that the spirit of France was not broken, and that after 100 years of warfare St. Joan of Arc showed France the way to a glorious victory. Frightfulness has never had any different result when practised against a virile nation.

Despite this, none of us wishes that in the next war the enemy should make the experiment of testing the powers of resistance of the British people by bombing residential areas with gas or incendiary bombs. To be secure, we must fulfil the conditions laid down by Marshal Foch and Mr. Bernard Shaw. We must have the ability to hit back—though the heavens forbid that we should ever have to use it! Even General Groves in his book, which we reviewed last week, seems to admit that we ought not to be the aggressors in the frightfulness business, but must hold the power of retaliation in our hands.

The bomber aeroplane must *not* be identified with gas bombs and baby-killing. It is a perfectly honourable weapon, of the same nature as a long-range gun, for the destruction of military objectives. As such it is perfectly futile for the Disarmament Conference to attempt to forbid its use in war. It is possible to forbid its manufacture in time of peace, though it now seems very unlikely that such a prohibition will be agreed upon, but the moment war breaks out every belligerent will certainly make haste to provide himself with this reasonable and honourable weapon. To assert this is not to say, as Mr. Baldwin once imprudently said, that all agreements would be broken in time of war. If so, why (as we have often asked) were not dum-dum bullets used in the last war? Why were disease bacilli not dropped in every enemy's water supply? Why were all prisoners not tortured to death? The reason is that absolutely unrestrained warfare is unthinkable. A line must be drawn somewhere, and it is not difficult to draw a line between atrocities and legitimate destruction of military objectives. The former should certainly be forbidden by the League of Nations. No agreement can prevent the latter.

Even if Geneva were to be so insane as to forbid the construction of bombers, we sincerely hope that the far greater folly of proscribing fighters will never be attempted. In most cases it is difficult to distinguish between weapons which are aggressive and those which are defensive, but one case is perfectly clear, namely, the fighter. That is purely a defensive weapon. As Capt. Cunningham-Reid pointed out in the House of Commons on February 7, fighters such as the so-called "Super-Fury" have not the endurance or the bomb-carrying capacity to be used for aggressive purposes. That honourable and gallant member said a good many things in his speech with which we cannot agree, but he was quite right in saying that the fighter is a defensive weapon. Therefore no one should object to our keeping ourselves well supplied with fighters. No one suggests that the fighter can prevent all hostile bombers from getting home on their targets, but when allied with good ground organisation they should be able to make the attack a very expensive business.

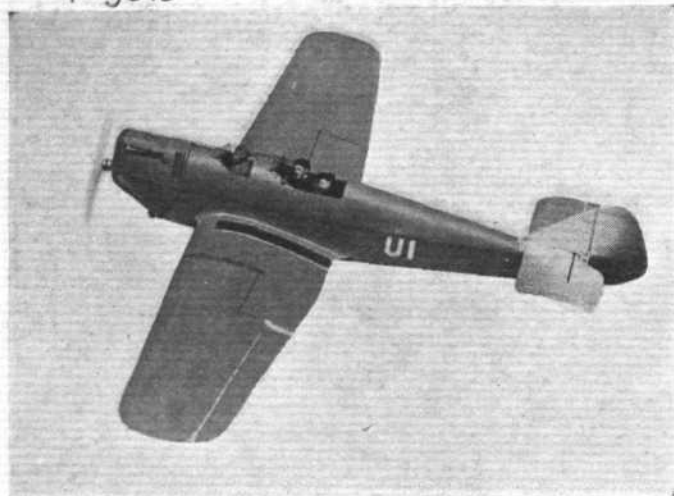
Moreover, so long as one maintains a large force of good fighters with well-trained personnel, one need have little fear of civil aircraft "misused for warlike purposes." If all fighters were to be abolished, then every civil machine would become a potential bomber. This fact is the great practical difficulty in the way of air disarmament, for no one has yet thought out a practicable scheme for preventing the "misuse" of such aeroplanes for warlike purposes. The one great antidote to converted civil aircraft is the use of fighter aeroplanes. The converted civil machine cannot be an efficient bomber, and it would certainly have an inefficient civilian crew. Of course a good pilot could be found, but a good pilot does not by himself make an efficient bombing organisation. The civil machine will not have the right sort of performance. The crew will not have the right sort of training. Experience of bombing tactics and bombing practice will be wanting. The fighting powers of the machine will certainly be poor. Everything will combine to make such a machine an easy prey for trained fighters.

Such facts should be understood by all who profess to speak with authority on the subject of air disarmament, but apparently they are regarded by many as insignificant details about which the tiresome experts may argue, but which are beneath the notice of a high-brow politician. For example, in a recent article in the *Sunday Dispatch* Maj. Gen. J. F. C. Fuller writes about vast Armadas rising into the air on the pressing of a button. He proceeds to ask: "What will they strike at? . . . Will they seek out each other? They may, yet I doubt it. . . ." This certainly shows a complete confusion of the functions of bombers and fighters. Bombing "Armadas" will certainly not seek each other out. Fighters will with equal certainty seek out the enemy bombers. We must just follow Gen. Fuller a little further. He says that it is unlikely that air fighting will assume the form of a vast duel "not only because of the risk and the losses such a battle will entail, but, etc." The idea that air forces will avoid battle because of risk and losses! Mr. Shaw is a conscious humorist, but the unconscious humorist is often more amusing. In these dreary February days we commend the writings of Gen. Fuller to anyone who feels that a laugh would do him good.

"OVER THE MOUNTAIN PASSES": Formation flights over ranges of mountains now appear to be a regular routine duty of R.A.F. squadrons in India. Here we see a somewhat awesome aerial view of an imposing mountain range taken from one of the composite flight of five Hawker "Harts" of Nos. 11 and 39 (Bomber) Squadrons which flew from Risalpur to Gilgit recently.



103015



A THREE-SEATER "HAWK"

BUILT at Reading by Phillips & Powis, Ltd., the three-seater version of their Miles "Hawk" ("Cirrus III") has a performance as suitable for joyriding as the old and well tried "Avro 504." Mr. Miles has re-designed the standard "Hawk" fuselage to carry two passengers seated comfortably one behind the other in the rear cockpit, access to which can be obtained from deep and wide doors either side of the fuselage. The outer portions of the wing of this machine remain exactly the same as the standard "Hawk," but the centre section has been increased in span by 2 feet, thus providing something in the region of an extra 12 square feet of wing area and putting up the aspect ratio to about 7 to 1. The result has been that although only powered with a Cirrus III engine, the "Hawk" three-seater, carrying an all-up weight of 1,800 lb., has the most remarkable take-off of anything we have seen for a very long time. Not only can it be pulled off the ground after a very short run indeed, but both the angle and rate of climb are large. This "Hawk" can also be dropped on to the ground from a very coarse glide and, even without the use of brakes, the resulting landing run is very short. Characteristics like these, coupled with the fact that it is exceedingly easy to get in and out of the passenger cockpit, and that the construction of the machine is such as to preclude the possibility of the need for repairs due to ordinary wear and tear, make it a proposition of outstanding merit for joyriding. When in the hands of an expert like Mr. Miles himself, this "Hawk" can be pulled off the ground very much more quickly than the figures shown in the table, and, moreover, can thereafter be held at a steep angle of climb which, although it looks exaggerated, is perfectly safe, and in that position the machine is still fully controllable. The machine is being supplied fully equipped with instruments, including compass, the new special down-turned exhaust manifold system making it quiet and pleasant to fly in, Bendix wheel brakes having differential movement controlled by the rudder bar and a hand lever for pulling up and parking, and, of course, it is built, as is the custom with all "Hawks," to factors considerably in excess to those required by the Air Ministry. Although Phillips &

"HAWK" 3-SEATER (CIRRUS IIIa.) (90 H.P.)

DIMENSIONS			
Wing area	..	181½ sq. ft.	(16,86 sq. m.)
Span overall	..	35 ft.	(10,67 m.)
Span, wings folded	..	15 ft. 10 in.	(4,83 m.)
Chord maximum	..	6 ft. 3 in.	(1,9 m.)
Length overall	..	24 ft.	(7,32 m.)
Height	..	7 ft. 8 in.	(2,28 m.)
Wheel track	..	7 ft. 8 in.	(2,28 m.)
Wheels	..	Palmer	
Tyres	..	Palmer 480 × 180	
Brakes (if fitted)	..	Bendix	

WEIGHTS			
Weight empty, inc. fixed equipment	..	1,045	(474)
Pilot	..	160	(73)
Petrol—22½ gall. (102,3 lit.)	..	170	(77)
Oil	..	20	(9)
Pay load	..	405	(183)
Weight loaded	..	1,800	(816)
Disposable load	..	755	(342)

PERFORMANCE			
Maximum speed at 1,000 ft.	114 m.p.h.	(183 km.p.h.)	
Cruising speed at 1,000 ft.	98 m.p.h.	(157 km.p.h.)	
Landing speed normal	38 m.p.h.	(61 km.p.h.)	
Take off run normal	80 yd.	(73 m.)	
Landing run with brakes	50 yd.	(46 m.)	
" " without brakes	80 yd.	(73 m.)	
Initial rate of climb normal	860 ft.p.m.	(4,4 m.p.sec.)	
Ceiling	..	Max. 18,000 ft.	(5,436 m.)
		Service 16,000 ft.	(4,850 m.)
Petrol consumption	..	5 gall. p.h.	(23,2 lit.p.h.)
Flight duration	..	4½ hr.	
Range (can be doubled)	..	450 miles	(750 km.)



THE NEW UNDERCARRIAGE: This view shows that the radius rod is now directly behind the compression leg, decreasing drag considerably. The view above gives a clear idea of the seating accommodation. (FLIGHT Photos.)



A CLEAN FRONT: Head-on the "Hawk" is very clean, a fact which no doubt largely accounts for its exceptional performance and acceleration on the ground.

Powis are one of the youngest aircraft manufacturing firms, a visit to their factory is exceedingly educative. They have studied the matter of economical production very carefully indeed, and for this reason they are able to turn out machines at the price they do. We have already described the neat manner in which the plywood covering of the wing, and for that matter the fuselage, etc., is held to the spars, ribs, longerons and struts by an ordinary office stapling machine during glueing. These staples squeeze together the parts to be glued, more efficiently than do screws or tacks, and when the glue is dry they are quickly removed, leaving the surface absolutely clear and free for finishing. The finish is yet another point about the "Hawk." Phillips & Powis have realised that machines for private use sell as much on finish and comfort as they do on performance, and the

new hand finish, which is standard on the "Hawk," is certainly as good as that of the average motor car. The Titanine dope with which this is attained has been particularly developed for the purpose, and the glass-like surface is achieved with only a very few coats, thereby saving the great weight of the 17 to 23 coats which it is understood is required by some of the American machines, about the finish of which a great deal has been advertised. This finish also has the advantage that it decreases the skin friction appreciably and adds to the performance of the machine. An indication of the strength of the "Hawk" is gained from the knowledge that, in its standard form, it is strong enough to be fitted with any engine up to 200 h.p. The firm has recently received recognition of its capabilities, by being approved for design by the Air Ministry.

AMERICAN AVIATION FINANCE

ALTHOUGH air mail poundage declined during 1933 in the United States, due to a 60 per cent. increase in the postal rates, the restrictive effects of this are gradually diminishing, and for the period July-October the poundage was 17 per cent. higher than in the previous year. It is estimated that transport aeroplanes covered a 28 per cent. greater mileage in 1933 than in 1932, that the number of passengers carried increased by about 10 per cent., and that the P.O. department provides about two-thirds of the operating revenues in the air transport business. About 25 million dollars are said to be spent, by the American public and the Government, with the air transport companies for carrying mail, passengers and freight. Air mail provides about 75 per cent. of the gross income of the Aviation Corporation of America, about 72 per cent. of North American Aviation, and about 64 per cent. of the United Aircraft & Transport.

The *Wall Street Journal* estimates that in the fiscal year ending June 30, 1934, Air Transport Aircraft would fly 51,700,000 miles, or 11.4 per cent. more than in 1933, and that they would carry 198,700,000 passengers, or 45 per cent. more than in 1933, and that the revenue from mail and express would be 27.8 per cent. and 20.8 per cent. higher respectively. The following notes have been issued by Frazier Jelke & Co., and, while believed to be reliable, are furnished without responsibility.

AVIATION CORPORATION, through American Airways, operates lines extending from New York and New England through the central States and over the southern route to California, and a direct service between New York and Chicago. It has 2,777,753 share of capital stock outstanding, and is believed to be controlled by the Cord interests. The cut in air mail payments reduced the profits for the third quarter to 3 cents a share, as against 14 cents a share in the second quarter. The stock rallied from a low level of $1\frac{1}{2}$ in 1932 to $16\frac{3}{8}$ last summer.

CURTISS WRIGHT CORPORATION is engaged chiefly in the production of aeroplanes and aero engines. Most of the company's airports have been sold, and it is understood that those retained are being operated at a loss. The company does not operate any air transport lines. The capital consists of a funded debt of 387,584 dollars, 1,147,321 shares of two dollar dividend non-cumulative Class A stock which has never paid a dividend and 6,719,645 shares of Common stock. The company has never earned anything on the Common stock, but net profits were probably sufficient to show about 65 cents a share on the Class A in 1933 compared with 8 cents a share in 1932 and 27 cents in 1931. They are reported to have obtained 30 per cent. of the U.S. military orders in 1933 and a foreign business of 3,000,000 dollars, equal to almost 50 per cent. of the total U.S. exports of aircraft.

DOUGLAS AIRCRAFT CO., INC., also own no transport lines. Until 1933 military orders accounted for the major portion of their business, but recently they have entered the transport market. Capital consists of 467,403 shares of Common stock of no-par value. Their earnings have a good record, this being 1.19 dollars a share in 1929, 2.02 in 1930, 1.60 in 1931, 20 cents in 1932, and estimated at about 30 cents in 1933.

PAN-AMERICAN AIRWAYS CORPORATION.—This company has an aggressive expansion programme. Its routes cover more than 26,000 miles, with contemplated extensions to the Far East and Alaska, and eventually to a trans-oceanic route. In the first half of 1933 its passenger volume was 59 per cent. larger and its express 92 per cent. larger

than in the first half of 1932. There are no estimates of earnings for 1933, but those for 1931 and 1932 were 21 cents a share and 1.36 dollars a share respectively.

SPERRY CORPORATION.—This is a holding company owning the entire capital stock of the Sperry Gyroscope capital and the Ford Instrument Co. 74.2 per cent. of the capital stock of Intercontinent Aviation Corporation and 115,232 shares of Class A stock, and 401,951 shares of Common Stock in the Curtiss Wright Corporation. Intercontinent Aviation Corporation operates a small line in South America. The Sperry Gyroscope and Ford Instrument companies are expected to benefit from the new building programmes, but are not yet substantial earners. The 1933 earnings for the Sperry Corporation are estimated at about 30 cents a share.

NORTH AMERICAN AVIATION CO., INC.—This company controls the General Aviation Co., which in turn owns 51 per cent. of the stock in Western Air Express, and a 27 per cent. interest in Transcontinental Air Transport. The company is generously capitalised with 3,435,033 shares issued. They earned 62 cents a share in 1929, 78 cents in 1930, 15 cents in 1931, and made a loss in 1932 and 1933.

TRANSCONTINENTAL AIR TRANSPORT, INC.—A holding company with $37\frac{1}{2}$ per cent. interest in Transcontinental and Western Air, Inc. The latter has never distributed any dividends, and the earnings of the holding company have been nominal. It operates the most direct route between California and New York, and may record a profit this year in spite of the lower air mail rates.

UNITED AIRCRAFT & TRANSPORT CORPORATION.—Probably the strongest unit in the aircraft industry. Its subsidiary, United Air Lines, conducts one of the largest transport air lines in the U.S.A., carries about 40 per cent. of domestic air mail, and receives about 1/3rd of the Government's air mail expenditure. The company's manufacturing subsidiary produces the Pratt & Whitney "Wasp" and "Hornet" aero engines. At the end of December, 1932, current assets were 23,868,000, compared with 1,865,000 current liabilities. All the company's Preferred Stock has been redeemed, leaving 2,100,000 shares of Common Stock, the only capital liability. Earnings for 1933 are estimated at about 1 dollar a share. It is believed that dividends may be initiated on the Common Stock during the present year. The stock has an active market and reached 162 in 1929, and was as low as $6\frac{1}{2}$ in 1932.

On December 20, 1933, Standard Trade & Securities Service summarised the position of aircraft manufacturers and the 1934 outlook as follows:—During the initial ten months of 1933 aggregate sales for all purposes were 16 per cent. higher than in the corresponding 1932 period, exports of aircraft and engines for the full year 1933 being estimated at 20 per cent. higher than 1932. Of the relatively little amount spent on U.S. military air equipment in 1933, Curtiss Wright and United Aircraft are believed to have obtained well in excess of 50 per cent. Deliveries of the new type transports by United Aircraft and Curtiss Wright subsidiaries have contributed the largest portion of the expensive transport business during the year. Douglas only recently commenced its deliveries for T. & W.A., and Pan-American Airways are providing substantial orders for large and costly flying boats in 1934. Apart from these contracts it is not expected that transport buying by American air lines will reach impressive figures until 1935. A further gradual revival is expected for 1934, but substantial profits betterment will be retarded by prevailing high wages and material costs.

Air Transport & Commerce.



FLYING PORTHOLES: Side view of the new transport plane manufactured by the Capelis Safety Airplane Corporation of Oakland, California.

THE CAPELIS MONOPLANE

THE twin-engined low-wing monoplane manufactured by the Capelis Safety Airplane Corporation, Ltd., which was described in *FLIGHT* for November 23, 1933, and is illustrated on this page, recently made its first test flights. Performance data are not available, but we are informed by *Shell Aviation News* that the machine functioned satisfactorily. The take-off run was noticeably short, but it is reported that, when landing, the machine was slightly unstable longitudinally. The undercarriage was not retracted for the first flights as the gear has not been perfected.

AIR TRANSPORTATION TO THE GREAT BEAR LAKE MINES

ACCORDING to the *Financial Post* (Toronto), Canadian Airways, Ltd., has concluded its fourth summer flying season in the Great Bear Lake area since the discovery of

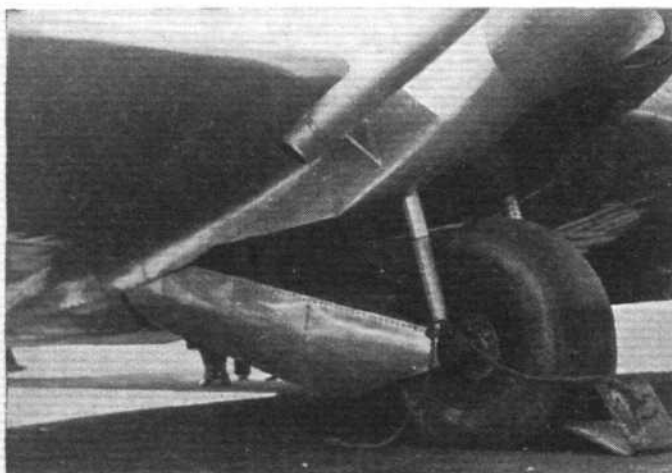
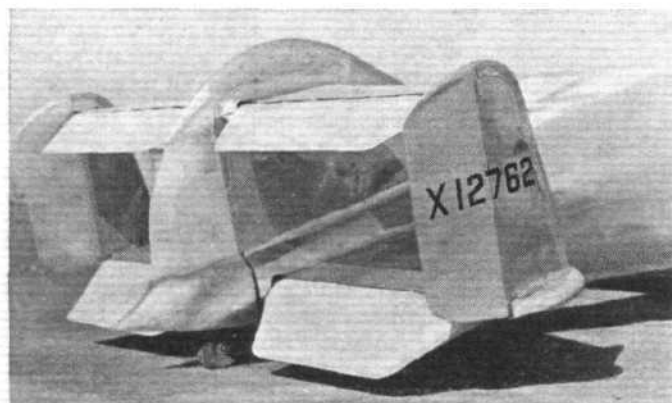
radium there. Flying revenue has increased by 50 per cent. during the past three years concurrently with a decrease of 50 per cent. in fares and freight rates. The company flew in the Mackenzie River area during the months of January-October, 1933, a total of 313,135 miles, carrying 42,524 lb. of mail and 396,846 lb. of express packages. The number of passengers carried totalled 812, passenger miles numbering 285,076. Although the aeroplanes have flown over an area 2,000 miles in extent from Fort McMurray to Aklavik, the longest space likely to prevent a landing by the pilot is 15 miles of rapids. From Edmonton to Cameron Bay, on Great Bear Lake, the distance is 1,085 miles, whilst from Waterways at the northern end of the Northern Alberta Railway system it is 805 miles. The longer hop has been made in as little as 7 hours 25 minutes as compared with many weeks by the overland or overwater route. The company operates this service with six permanent aeroplanes supplemented by others as traffic demands. It is creditable that during last summer's flying season no passenger was involved in any accident, and on no occasion was there as much as five minutes' delay. Since the commencement of the air mail in the Mackenzie District, no passenger has suffered by accident and not one piece of mail has ever been destroyed. The summer flying season (with pontoons) in 1933 started on June 10 and ended October 6. Winter flying with skis began on November 15 and November 25, and will continue until about April 15, though it may be lengthened by relaying supplies to intermediate bases where the season permits the use of either the pontoon or ski-equipped aeroplanes. No night flying is done in this area, it being borne in mind that in this northern latitude the sun only dips below the horizon for short periods at midnight. Present flying rates per passenger are about \$375 for the return journey from Waterways to Great Bear Lake.

COMMERCIAL AVIATION IN CHINA

WITH reference to our article on "Commercial Aviation in China," published in *FLIGHT* for November 2 last, our friends the Asiatic Petroleum Co., Ltd., inform us that they understand that China National Aviation Corporation maintains a bi-weekly, and not a daily, service between Shanghai and Canton. Furthermore, they tell us that Hong Kong is not included in the service, since the Hong Kong Government will not allow this port to be called at until British aircraft are given reciprocal rights in China. For which information, many thanks.

GERMANY-SOUTH AMERICA SERVICE

As reported last week, Luft Hansa opened its air mail service to South America on February 3, when a Heinkel H.E.70 left Stuttgart for Seville with 400 lb. of mail. After changes of machine at Seville, Las Palmas and Bathurst, the mail completed its journey across the Atlantic in the Dornier "Wal" *Taifun*, arriving at Port Natal on February 7. Thence it was taken to Buenos Aires in a Brazilian Condor Syndicate machine. The return trip from Natal started on February 9, and Berlin was reached February 12—in 3 days 8 hours 40 minutes!



CAPELIS DETAILS: The biplane tail (top) and retractable undercarriage of the Capelis transport plane.

SHORTS' "SCION"



13891

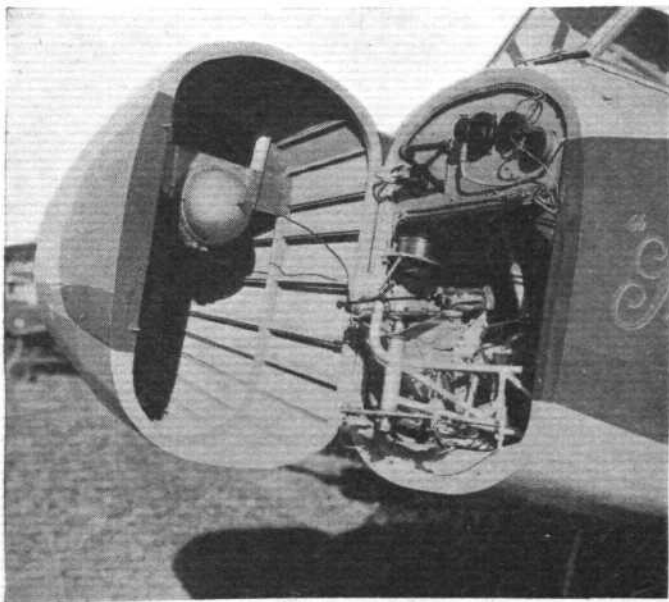
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36 H.P. PER PAYING PASSENGER : The Short " Scion " with its low power per passenger is a most economical aeroplane. (FLIGHT Photo.)

WE have already had the pleasure, in our issue for September 21, 1933, of describing briefly the new small monoplane of Short Bros. This twin, Pobjoy engined, monoplane has now been called the " Scion," and we have recently had an opportunity of trying it out for ourselves. With five passengers and a pilot, on two 85 h.p. engines, it will be seen that the machine represents a very economical proposition for feeder line or similar passenger transport. In point of fact, the design is the outcome of an extensive survey carried out by Short Bros. to determine whether there was a demand for a machine with a very high payload which it would be economical to use for short

distance transport. They came to the conclusion that there were many places in Great Britain, and of course still more abroad, where stretches of water intervene between two important towns, or other geographical features make a cruising speed of 100 m.p.h. more than sufficient. Since our last description, the maximum

13889



OPEN SESAME : For ease of maintenance the nose of the " Scion " can easily be swung open. It also carries the air bottle for the Dunlop wheel brakes. (FLIGHT Photo.)

SHORT " SCION " 2 Pobjoy " Niagara " (90 h.p.)

DIMENSIONS

	ft.	in.	m.
Span of main plane	42	0	(12,8)
Overall length	31	4	(9,55)
Overall height	10	4½	(3,16)
Fuselage width	3	6	(1,07)
Wheel track	9	8	(2,94)
Main plane area	255 sq. ft.		(23,7 sq. m.)

WEIGHTS

	lb.	kg.
Tare weight (fully equipped) ..	1,700	772
Fuel 30 gall.	230	104
Oil 3 "	30	13,6
	1,960	889,6

The maximum permissible weight is 3,000 lb. (1,360 kg.) which, with full tanks, gives a pay load including the pilot, of 1,040 lb. (472 kg.)

PERFORMANCE AT AN ALL-UP WEIGHT OF 3,000 LB.

Maximum speed. Ground level..	117m.p.h.(188,5km.p.hr.)
Cruising speed at 90 per cent. normal v.p.m., i.e., 2,700 r.p.m.	90 m.p.h. (145 km.p.hr.)
Landing speed (no wind) ..	47.5 m.p.h.(76,5 km.p.hr.)
Rate of climb. Ground level ..	600 ft. m (30,5 m.p.sec.)
Service ceiling	11,500 ft. (3,500 m.)
Take-off time. No wind..	12 sec.
Take-off run	120 yd. (109,5 m.)
Landing run	100 yd. (91,5 m.)
Range at above cruising speed ..	360 miles (580 km.)
Petrol consumption	7.5 gall.p.h.(34,1 lit.p.hr.)
Air miles per gallon at above cruising speed..	12.0

permissible weight has been increased to 3,000 lb., at which the take-off in no wind is only 12 sec. With the new Pobjoy "Niagara" engine, which will be fitted as standard, the take-off should be only 10 sec. or even better. In the air, from the pilot's point of view, the machine is admirable. It is easy, straightforward and normal to fly, and the outlook is, of course, excellent. In the passenger cabin each passenger has ample room,

with a good view through the deep side windows. On the ground a full depth door in the port side of the fuselage allows the passengers to get in and out of the cabin easily. The design has now received its C. of A. after passing through Martlesham with flying colours, and is going into production at Rochester, the first batch being laid down right away. This first model is shortly making a tour of the country for demonstration.

LONDON, SCOTTISH AND PROVINCIAL AIRWAYS

A DEMONSTRATION of various types of aircraft, particularly the Airspeed "Courier," was given on Friday, February 9, by London, Scottish & Provincial Airways at Tollerton aerodrome, before a party of civic authorities and business men from Derby, Nottingham, Manchester, and Hull. According to the organisers, the purpose of the demonstration was "to emphasise to the population of Midland towns the vital importance of speed and to demonstrate the types of aircraft which are to be used towards gaining this end." In a booklet distributed to the visitors, describing the proposed London-Glasgow air service, the traveller is promised breakfast in Glasgow and lunch in Paris, and of the four services daily which are contemplated, it is claimed that the travelling times from centre to centre will be less than half the time taken by the quickest trains. The original intention of the company was to start a service between Croydon, Derby, Manchester and Glasgow. It now seems that, although the company has offered to take over the complete management of the proposed airport of Derby, to build it and run it, if the corporation will only provide the site and the necessary facilities, the corporation is showing extreme caution. Sir John Bell, Chairman of the Aerodrome Sub-Committee, thinks that the Derby Town Council might acquire land adjacent to Derby suitable for an aerodrome. On the other hand, another member of the Aerodrome Sub-Committee is not convinced that an aerodrome is going to be of any material

benefit to Derby. He claims that Derby is not like a port, where an aerodrome is certainly an advantage. If the Derby Corporation do not see fit to provide an aerodrome as a port of call for the proposed London-Glasgow route for the London, Scottish & Provincial Airways, it is probable that Tollerton aerodrome, which is near Nottingham, will be used instead. If negotiations with both towns prove fruitless, the service will carry straight through to Manchester.

At the display on Friday, flights were given to anyone interested in the proposed services, and many local celebrities were made air-minded. The Airspeed "Courier" (Siddeley "Lynx") was in great demand, and a Blackburn "Segrave" (two "Gipsy III's") assisted in the good work. Four "Couriers" fitted with "Lynx IV C" engines have been ordered by L.S.P. Airways. Visitors from Derby were particularly interested in a "Hart" and a "Horsley" loaned by the Air Ministry to Rolls-Royce, Ltd., for testing new types of engines.

Visitors to the demonstration included the Lord Mayor of Nottingham, the Deputy Sheriff, Mr. Richards, the Town Clerk and three other councillors. From Manchester came Alderman Sutton, Mr. Harges and Mr. Lamb, and from Derby, Sir J. F. Bell, Messrs. Durose, Malender, Clark and Fuller. Mr. Wormald and other members of the staff of Rolls Royce Ltd., were also present.

Mr. Stanley Bell, managing director of L. S. P. Airways and Mr. Burnside recently flew to Hull. It is one of the intentions of L. S. P. Airways to connect their London-Glasgow service with the K. L. M. Amsterdam-Hull service.

THE "GRAF ZEPPELIN"

A REGULAR service to Brazil operated by the *Graf Zeppelin* will be resumed on May 26 next. The following time-table has been arranged:—

Friedrichshafen	Pernambuco	Rio de Janeiro	Pernambuco	Friedrichshafen
dep. Saturday	arr. Tuesday	dep. Thursday	arr. Friday	dep. Tuesday
a.m.	p.m.	a.m.	p.m.	p.m.
26 May	29 May	31 May	1 June	5 June
23 June	26 June	28 June	29 June	3 July
21 July	24 July	26 July	27 July	31 July
4 Aug.	7 Aug.	9 Aug.	10 Aug.	14 Aug.
18 Aug.	21 Aug.	23 Aug.	24 Aug.	28 Aug.
1 Sept.	4 Sept.	6 Sept.	7 Sept.	11 Sept.
15 Sept.	18 Sept.	20 Sept.	21 Sept.	25 Sept.
29 Sept.	2 Oct.	4 Oct.	5 Oct.	9 Oct.
13 Oct.	16 Oct.	18 Oct.	19 Oct.	23 Oct.
27 Oct.	30 Oct.	1 Nov.	2 Nov.	6 Nov.

No landings will be made at Spanish ports. The Syndicato Condor, Ltda., will arrange for large passenger aircraft to operate a service from Rio de Janeiro to Buenos Aires on the arrival of the airship at Rio. Fares have been reduced by about 20 per cent. and are now as follows:—Friedrichshafen-Pernambuco, RM. 1,400 (early and late season), RM. 1,550 (busy season); Friedrichshafen-Rio de Janeiro, RM. 1,500 (early and late season); RM. 1,650 (busy season); Pernambuco-Rio de Janeiro, RM. 400 (all time). The busy season on the Europe-South America route is from September 1 to December 31, while in the opposite direction it is from March 15 to June 30. Small supplementary charges are made for certain lower berths and cabins situated immediately behind the large saloon of the airship. These charges vary from RM. 100 to RM. 250. During May, June and July the *Graf Zeppelin* will make short trips over Switzerland.

ANOTHER CATAPULT SHIP

DEUTSCH LUFT HANSA and the "Hansa" Steamship Co., of Bremen, have been negotiating for the purchase of the motorship *Schwarzenfels* for use as a catapult ship on the South Atlantic route. The negotiations are reported to be approaching completion. It is intended that the new vessel should be modified as a catapult ship either at the Weser dockyard at Bremen or at the Deutsch Werft dockyard at Kiel. She was built in January, 1925, and has been used on the Far East route. It is reported that one of the two Dornier "Wals" belonging to the catapult

ship *Westfalen* has been lost in a rough sea near the ship. The crew have been saved. The aircraft was making one of the last trial flights before opening a regular service.

ELISABETHVILLE-BROKEN HILL AIR MAIL

ENCOURAGING results have been obtained during the past five months on an air service operated by a syndicate between Elisabethville and Broken Hill. This service connects with the main Imperial Airways route from Cairo to Capetown. The receipts from postal transport for the five months of operation total 33,390 Belgian francs.

NORTHROP "DELTA" FOR THE A.B.A.

WE reported some months ago that the Swedish A.B. Aerotransport Company had acquired a Northrop "Delta." This purchase has been followed by an order for another machine of the same type, for use on the night air mail route between Stockholm, Malmö and Hannover. The aircraft differs somewhat from the standard "Deltas." Pilot and wireless operator are seated to the rear of the wing, and the freight compartment, which is fitted with a large door, is forward of the cockpits. With Pratt & Whitney "Hornet" T2DI engine of 645 h.p., the following performance for a gross weight of 7,040 lb. is claimed: Top speed, 205 m.p.h.; landing speed, 59 m.p.h.; climb at ground level, 1,150 ft. per min.; service ceiling, 16,400 ft.; and gliding angle, with air brakes, 5:1. The machine will be delivered in May.

PACIFIC AIR SERVICES

MR. WILFRED KINGSFORD SMITH announced in Wellington plans for an air service covering almost the whole of New Zealand, in which Sir Charles Kingsford Smith will be financially interested. The scheme involves the formation of a Dominion Airways Company, a fair amount of capital for which has already been promised. The company will operate without a Government subsidy, and will employ three Wackett "Codock" planes, and two feeder planes.

The air services between Launceston, Tasmania, and Melbourne now include King Island as a port of call, as well as Flinders Island. King Island Aerodrome was officially opened on December 2 last. Sir Ernest Clark, Governor of Tasmania, was to have performed the ceremony, but owing to bad weather was unable to reach the island.

From the Clubs.

BRISTOL AND WESSEX AEROPLANE CLUB

Flying times for the week totalled 36 hr. There was one first soloist, Mr. M. V. Williams. On Friday, February 9, the directors of the Club held a dinner at the Airport Clubhouse, the guests of the evening being Mr. Herbert Thomas, President of the S.B.A.C., and Lord Apsley, D.S.O., the President of the Bristol and Wessex Aeroplane Club. The directors of the Club present were: Councillors A. H. Downes-Shaw, Chairman of the Club, R. Ashley Hall, Messrs. L. Leaver, J. Tratman, A.F.C., P. Hough, D. C. Love and the Hon. H. C. H. Bathurst. The dinner was also attended by Capt. L. P. Winters and Flt. Lt. R. W. M. Hall, Manager and Chief Instructor of the Club respectively. In proposing the health of the guests, the Chairman of the Club referred to the assistance given by the Bristol Aeroplane Co. to the Club. Mr. Thomas replied and Lord Apsley related some of his experiences during his recent flight to Australia and return.

HANWORTH (N.F.S.)

Flying times for the week on Club aircraft amounted to 47 hr. 30 min., there being one new pupil, Mr. H. J. W. Nobuyuki, from Japan. Messrs. von Bahr and Walters have now finished all their tests for "B" licences. Messrs. Back and Kirwan have also carried out further tests for "B" licences. Quite a collection of machines has been through the workshops during the past week—a Saro "Cloud," a Miles "Satyr," a Handley Page "Hare," a D.H. "Dragon," a "Fox Moth," a "Gipsy Moth," a Klemm, an S.M.I., an Autogiro, a Desoutter, a "Bristol Fighter" and an "Avian."

YORKSHIRE AEROPLANE CLUB

The flying times for the week totalled about 13 hr. Miss E. Brooke has joined the Club as a non-flying member. The Club was visited during the week by Mr. D. W. Llewellyn, from Hanworth.

BROOKLANDS

The improved weather during the past week has resulted in the Club machines being kept fairly busy, the total hours flown being 50. New members who have joined are: Miss Fay, Messrs. A. J. Edmunds, E. M. Jones, P. F. Daniell and G. G. Farguason—the latter is taking a course for the instructors' certificate with Capt. Findlay. Mr. Pacey did a successful first solo. Due to the co-operation between the Cinque Ports Flying Club and Brooklands, three "B" licence night-flying tests were carried out in one night; they were done by Messrs. Harrison, Edmunds and Addinsell. The Sales Department will shortly have a demonstration "Leopard Moth" for prospective purchasers.

HATFIELD

The flying times for the R.A.F. Reserve last week amounted to 12 hr. 20 min. F/O. D. G. Ross, who is putting in hours for a "B" licence, did several long cross-country flights. The London Aeroplane Club flew 49 hr. 20 min. during the past week. Messrs. A. J. Baker and G. Singh have completed tests for "A" licences. Mr. Ross Kirkman is nearly ready for solo, and Mr. Gilbert Elliott has been piling up hours by various cross-country flights in the comfort of the Club's "Puss Moth." Among new members the Club has pleasure in welcoming Mr. H. L. Brooke, who recently acquired *The Heart's Content*, and came to do some dual before trying it out, and Mr. Hisamaro Yukami, from Japan, who is at the Club for two weeks, during which time he hopes to take his "A" licence. One of the Club's members has very kindly presented a Silver Cup to be won by the candidate with the highest total of marks out of three separate landing competitions. The first of these competitions will be held on Sunday, February 25, at 2.30 p.m. Members who wish to take part should give in their names to the Assistant Secretary.

Mr. Richardson had some dual in the Stage and Screen Club machine and Sir Cedric Hardwicke paid a visit to the aerodrome.

Private owners who took advantage of the recent fine weather included Sir Derwent Hall Caine, Mr. Place, Lady Loch, Capt. Bristol, Capt. Monohan, of the American Embassy, and Mrs. Whitbread. Visitors to the aerodrome included Messrs. Shuttleworth, Gordon Selfridge, Jr., Taylor, Batchelor, Lipton, Powis, Barrington von Bahr,

and Black. A smoking concert was held at Stag Lane on Friday, February 9, at which the Hatfield team were presented with the Cup for the Interdepartmental Billiards and Snooker Tournament. Mr. R. E. Hardingham, the Chief Ground Engineer, who has been with D.H.'s for 13 years, is leaving to take up an appointment with the A.I.D. The M.G. Club Rally was held on Saturday, February 3, and was much interfered with by the rain.

READING AERO CLUB

The Annual General Meeting of the Reading Aero Club has been fixed for 6.30 p.m. on March 11, and the annual "At Home" for Saturday, June 9. During the week the Club formation visited Brooklands and Hanworth. Messrs. Richard Ovey and G. L. Armitage have joined the Committee of the Reading Aero Club to represent the interests of the Berks, Bucks and Oxon Club. During the week Mr. Gill qualified for his "B" licence with the Phillips & Powis School. The new three-seater "Hawk" has been doing a lot of flying. Mr. Cliffordson has taken delivery of his "Leopard Moth" and the Sales Department has disposed of a "Gipsy I Moth" to Germany.

CARDIFF AEROPLANE CLUB

The flying returns for the week record 6 hr. 35 min. dual, 8 hr. 55 min. solo and 1 hr. 15 min. tests. New flying members are Messrs. W. I. Briggs, L. R. Turnbull, C. S. Pine and R. J. Horton. The Chairman, Capt. W. R. Bailey, has recently completed a blind-flying course at Hamble, and several members have done cross-country flights to Hamble and back. A first solo was done by Mr. C. H. Hogg, who was one of the finalists in the *Western Mail* Scholarship Scheme. He had only 3 hr. 30 min. dual.

LIVERPOOL AND DISTRICT AERO CLUB

The weather conditions have been good throughout the week and 22 hr. 35 min. dual and 20 hr. solo have been flown.

AIR SERVICE TRAINING ACTIVITIES DURING JANUARY, 1934

In spite of the bad weather during the earlier part of the month, the School was very active during January, a total of 326 hours having been flown. There was a large influx of new pupils. Messrs. J. S. Hall, J. Liver, D. W. Sifton and P. E. Rees joined for the three years' Long Course, which is designed to give the graduate the best possible training for commercial aviation. Messrs. G. F. Atkinson and H. MacDonald joined for the "A" licence, F/O. E. Esmonde for the wireless and ground engineers' "A" and "C" licences, Mr. J. Wood for the wireless course, Mr. W. R. G. Harvey for the ground engineers' "A" and "C" licences and Mr. C. H. Hwang, from China, for the pilots' "A" and "B" licences.

Messrs. R. T. Needham and J. C. Hornby arrived at the School in connection with arrangements whereby a number of students undergoing training for their ground engineers' licences at the College of Aeronautical Engineering at Chelsea, are to be transferred to Air Service Training during the latter part of their studies with a view to affording them practical experience in the maintenance of aircraft and engines.

During the month, Messrs. M. A. Choksey, R. M. Coull and P. V. McKinnon obtained their "A" licences, Mr. G. N. Beckmann, who has since joined Imperial Airways as a First Officer, his ground engineers' "A" and "C" licences, and F/O. A. le R. S. Upton his second-class navigators' certificate.

The Avro "Tutors" were modified, and are now identical with the type which is being introduced into the Royal Air Force as standard equipment for *ab initio* flying training, with the exception that they are also provided with fuel and oil systems for inverted flying, thus considerably enhancing their aerobatic qualities.

A number of hockey, soccer and squash matches were played. In the latter sport the results were:—A.S.T. v. R.A.F., Calshot, 2—2, A.S.T. v. R.A.F., Gosport, 2—2, and A.S.T. v. Leamington Tennis Court Club, 2—3.

JOHANNESBURG AERONAUTICAL ASSOCIATION

This Club has inaugurated a new scheme of flips for children in pursuance of their new policy of teaching the young to be air-minded. The results have been very good. On Sunday, January 14, 104 flips were given by a "Dragon," a "Fox" and a "Puss Moth," while 25

flips were given the day before. A "Gipsy Moth" provided stunt flights. There has also been a gratifying response to the new blind-flying courses which have been inaugurated, the total hours of dual blind flying for the week ending January 14 numbering 8 hr. 55 min., an increase of nearly 100 per cent. over the previous week's total. There are now 13 blind-flying students on the books. Flying time for the week totalled 34 hr. 55 min.

FLYING AT ALEXANDRIA

Residents at Alexandria are lucky in possessing an aerodrome at Dekhela. The landing area is of ample size for all ordinary purposes, and besides having a good surface, is covered for the most part with scrubby grass, thus obviating that bugbear of most Egyptian aerodromes, dust. The majority of desert aerodromes are naturally sand. This does not matter when they are situated far from human habitation, but when there is a flying clubhouse on the aerodrome boundary, this sand can be more than unpleasant if thoughtless pilots taxi off with the tail of their machines pointing at the house. At Dekhela, there is very little dust, and consequently the Club is a delightful place at which to spend an afternoon. Its geographical position also adds to its value as a resort, because it is situated on a spit of land between the sea

and the lake which lies to the west of the city. Bathing can therefore be added to the delights of the Club, while it is possible that tennis courts will be made when the membership warrants the expenditure. There is already quite a large membership, numbering something over 70, and the percentage of flying members is also very satisfactory. The Club's foundation is largely the result of the energetic work of Mr. Metzger, the proprietor of the well-known Hotel Cecil in Alexandria. The members are undoubtedly lucky in having a man of his capability and knowledge working for their benefit. Mr. Metzger has wished to start a flying club for some considerable time, and when Airwork, Ltd., together with the Banque Misr of Cairo, started operations at Almaza, the chance came to get going at Alexandria. Now the firm of Misr Airwork is, as our readers know, running a twice daily service between these two places. Alex., as it is known all over the world among English-speaking peoples, keeps its flying instructor, Mr. J. Parsons, very busy giving dual instruction, and also boasts three privately-owned machines. The members do a lot of flying—unlike the far-too-common breed which gets an "A" licence and then forgets to fly except at rare intervals—and five machines, led by the Club instructor, recently made a tour to Palestine.

Airisms from the Four Winds.

Sir P. Cunliffe-Lister

SIR PHILIP CUNLIFFE-LISTER, the Secretary of State for the Colonies, who was taken ill while on a tour in East Africa, has recovered sufficiently to resume work. He hopes to visit Kakamega to study the steps taken by the Government in the interests of the natives in the mining industry.

Mlle. Maryse Hilsz

THE French airwoman, Mlle. Maryse Hilsz, who is flying from Paris to Tokio, arrived at Dum Dum aerodrome, Calcutta, from Jodhpur.

An African charter

As already mentioned in FLIGHT, Capt. Olley has now formed a firm of his own (Olley Air Services, Ltd.), with an office at Croydon. He now tells us that he will be leaving this country on February 20 on his first charter. The "Dragon" which he is using has been given increased fuel tankage, putting the range up to 900 miles. On this charter he will be operating for a City firm of engineers, and the route will lie through Egypt, East Africa, Abyssinia, Uganda, and Tanganyika, lasting over two months.

Frank Hawks to demonstrate "Condor" bomber

CAPT. FRANK M. HAWKS is to sail on February 17 from Seattle to demonstrate the new Curtiss "Condor" bomber to the Chinese National Government. This aircraft is similar in general design to the "Condors" used by American airways and Eastern Air Transport. Four machine guns are fitted. It will be remembered that the old type of Curtiss "Condor," fitted with two Curtiss "Conqueror" engines, was a standard type for many years in the U.S. Army Air Corps.

A British Entry for International Aerobatic Contest?

ORGANISED by the newspapers *Le Petit Parisien* and *Air Propagande*, an international aerobatic competition, named "Coupe Mondiale d'Acrobatie Aérienne," will be held at Vincennes, near Paris, on June 9 and 10. The prizes amount to 300,000 francs, of which 100,000 will be awarded to the winner, 75,000 to the second and 50,000 to the third. It is reported that the following entries have been received:—Detroyat (France), Al Williams (U.S.A.), Fieseler (Germany), Colombo (Italy), Staniland (Great Britain), Orlinsky (Poland), Hansen (Denmark) and Van Damruch (Belgium). Judging from what we have seen of Staniland's masterly handling of the "Firefly," he should have little to fear from the aerobatic "aces" of other nations.

Veto on French aerodromes

THE British Air Ministry issued the following warning to pilots flying to France on February 7:—"As the departure of any private aircraft from aerodromes in

France has been temporarily suspended by the French Government, private pilots intending to leave this country for France are warned that they may be unable to reach their ultimate destinations by air while this order is in force. The order does not apply to regular air transport services. British pilots are accordingly advised to consult the Civil Aviation Department, Air Ministry, as to the position before leaving for France." The ban was subsequently lifted, and normal traffic resumed.

Colours in the sky

A REPORT from Moscow states that the Central Meteorological Bureau has issued a brief statement of the results of the stratosphere ascent which took place in January. The records which have been salvaged from the wreckage confirm the observations made by Professor Piccard, and the previous Soviet ascents, with regard to the colour of the sky. The records indicate that the colour of the sky was blue at 8,500 m. (5.27 miles), dark blue at 11,000 m. (6.82 miles), dark violet at 13,000 m. (8 miles), dark violet to blue at 19,000 m. (11.78 miles), black violet at 21,000 m. (13 miles), and black grey at 22,000 m. (13.64 miles).

Monument for Soviet Stratosphere Heroes

THE Central Council of Osoaviakhim (Society for the Promotion of Aviation and the Chemical Industry) has decided to erect a monument to the memory of the three heroes of the stratosphere who perished on January 30. The monument will be put up on the territory of the Moscow Central Aviation Club.

U.S. stratosphere ascent

AN attempt is to be made in America to reach a height of 15 miles. A committee of scientists under the auspices of the National Geographic Society is co-operating in the plans for the ascent. The gasbag of the balloon will have a capacity of 3,000,000 cu. ft., and the gondola will be twice the size of that used by Professor Piccard. Capt. A. W. Stevens, of the United States Army, who reached a height of 39,150 ft. in 1928, will be the observer, and Maj. William Kepner the pilot.

The Fairey "Shamrock"

MR. C. R. FAIREY, who is Rear-Commodore of the Royal London Yacht Club, has purchased *Shamrock V* from Mr. T. O. M. Sopwith. Mr. Sopwith is building a yacht to be called *Endeavour* with which he will attempt to regain the America Cup.

New aerodynamic balance

LIKE so many great inventions, simplicity is the keynote of a new aerodynamic balance which M. Toussaint, of the St. Cyr Laboratory in France, has designed. Hitherto it has been the universal custom to "weigh" the forces on a scale model, plot the figures at the different air speeds and/or angles of incidence, etc., and draw curves through the points thus found. M. Toussaint has devised

a scheme whereby the polar of the test run is traced direct by a beam of light on a sensitive paper. If L and D of a model aeroplane are being tested, all that is required (assuming, of course, that the wind speed in the tunnel is steady) is for the operator to increase the angle of incidence through the required range, and the polar is drawn automatically for the range covered. During preliminary tests, M. Toussaint found certain gaps in the polar curve, and he is now at work on tracking down the cause for these.

Kadenacy in England

OUR French contemporary *Les Ailes* reports that M. Kadenacy has disposed of the British rights in his invention (which we have dealt with in FLIGHT from time to time recently) to Vickers-Armstrong. The Kadenacy cycle, it may be recollected, makes use of the theory that in leaving the cylinder the exhaust gases rush out with such velocity as to leave a virtual vacuum in the cylinder. This is used by M. Kadenacy to draw in the fresh charge.

The Hawker "Hardy"

It has been decided that the official name of the Hawker G.P. aeroplane to Specification 23/33 is to be "Hardy." This machine is a two-seater developed from the "Hart" for general purpose use in the East. It has extra tankage to give it increased range, and provision is made for carrying desert equipment, such as drinking water, food, etc. It is understood that certain squadrons in the Eastern Commands will shortly be equipped with the "Hardy."

No. 47 (Bomber) Squadron in the Sudan

COL. B. T. WILSON, D.S.O., read a very interesting paper on "The Sudan of To-day" before the Royal United Service Institution on Wednesday, February 7. Speaking of the work of No. 47 (Bomber) Squadron, he said that its "Gordons" were so useful that it would be exceedingly awkward for the administration to do without them. He said, however, that experience had shown that air action was more certain and more humane when used in conjunction with ground troops than when used independently. Since the appointment of Marshal Balbo as Governor of Tripoli, the Italians had raised the question of the boundary between Tripoli and the Sudan, and had laid claim to Merga oasis, which the lecturer said was about 200 miles on the Sudanese side of the frontier. The landing ground at the oasis was a very bad one, and he showed a slide of an unfortunate "Gordon" which had tried to level it out while landing, and had stood on its nose. It had to be burnt, and if the Italians ever get there they will find its remains. He thought that possibly the Italians want to fly from Tripoli to their colony of Eritrea (Somaliland) without landing on Sudanese territory.

The lecturer also mentioned the growth of civil flying in the Sudan and believed that last year some 400 civil aeroplanes had landed at Wadi Halfa.

Air cushions not wanted

ATTENDANCE at the Royal Aeronautical Society's lectures has for many years been accompanied with a heroic feeling akin to that of those pilgrims who walk with peas in their shoes—only the pains were not in the feet, as the audience at the lectures had to sit on the benches in the hall of the Royal Society of Arts. Now all that is changed, in accordance with the general tendency to a softer world; those benches have been replaced with seats not unlike those we get in cinemas. Each person will have one to him or herself. The back is curved and padded, which removes yet another ache and pain. We only hope that the lectures are never held after dinner, because then those seats would surely not be conducive to wakeful listening.

M.P.'s travelling vouchers

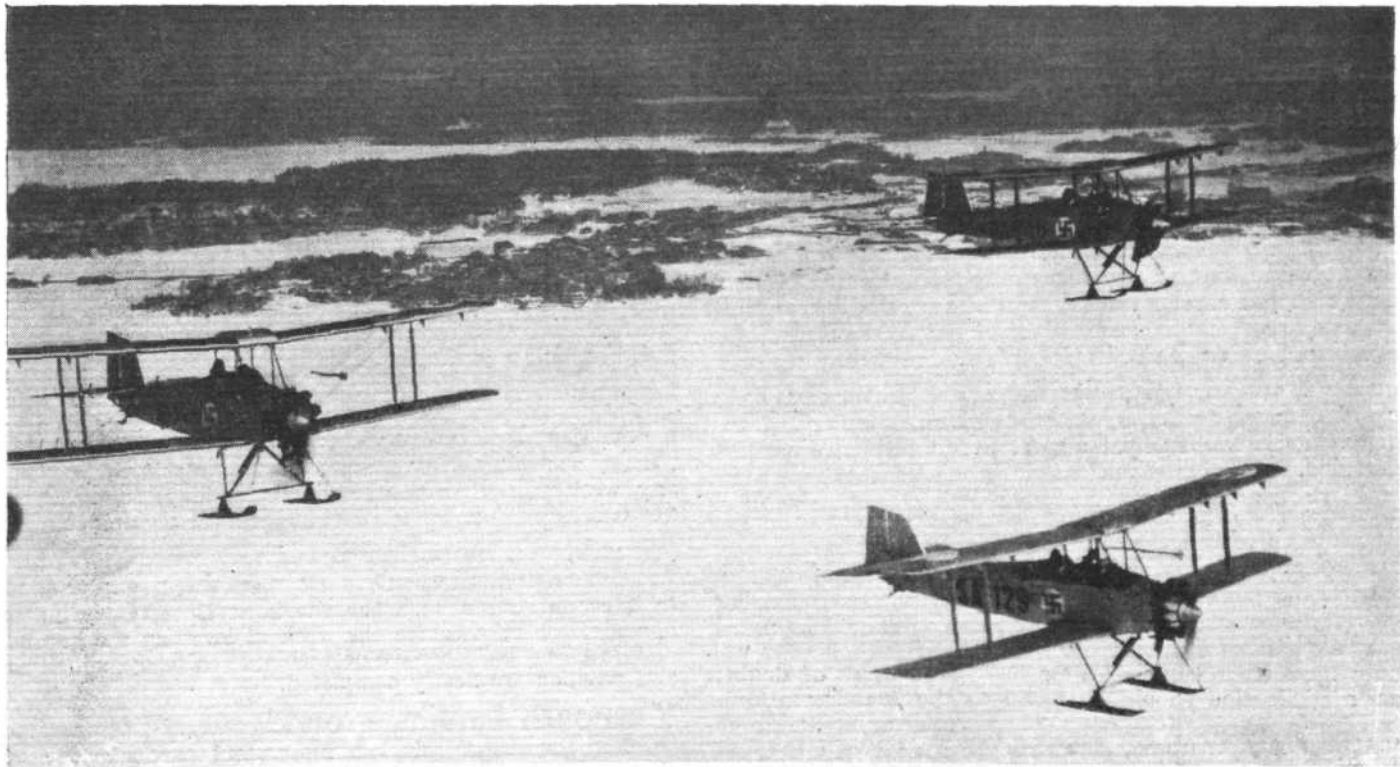
ON February 7, Mr. Everard asked the Under Secretary of State for Air whether facilities could be given to Members of Parliament who fly to London, instead of using the railway vouchers, to use free of charge the most convenient Government aerodrome. Sir Philip Sassoon did not consider the suggestion practicable, whereupon Sir N. Stewart Sandeman asked, "Is not flying by air much too safe?"

Holland, the Aviator's Eldorado

THE well-known Dutch flyer and aeronautical writer, Mr. A. Viruly, is writing a brochure under the auspices of the A.N.W.B., the Dutch tourist association, which it is hoped will attract foreign, and especially English, aviators to pay an aerial visit to Holland. The author points out that Holland is almost an ideal country for the private flyer. Its rivers and canals are splendid "sign-posts" to the flyer, and forced landings lose all their terrors when you know that you will come down on flat meadows which could give some official landing grounds points in the matter of surface. All one has to do is to keep clear of the cows! And if they do not run away at the sight and sound of the machine, then one may be sure that there is an aerodrome in the neighbourhood. Of more practical interest, perhaps, is the news that Holland will soon have in operation a system of radio signals specially for sports flyers, so that anyone carrying a small receiver will be able to determine his position at any point over Dutch territory.

Citex Koolmotor alcohol blend spirit

It is pointed out to us that Cities Service Oil Co., Ltd., were marketing their Koolmotor alcohol blend all-motor spirit in the early part of 1932, and that 25 per cent. of this blend is entirely produced in the United Kingdom.



SKIS IN THE SKIES : Three Finnish Sääski light training biplanes patrolling near Viipuri.

Airport News.

CROYDON

THE commercial utility of air transport is never more clearly demonstrated than during the periodic "gold rushes," when bullion has to be moved from country to country with the minimum loss of time and with the utmost safety. Last week something like 30 tons of gold left Croydon by air, and some 20 tons were carried in specially chartered machines. Eleven big machines transported about 15 tons during a day of very unpleasant flying weather, and the value of zone traffic control was obvious. There were numerous machines of different nationalities in the air at the same time, yet there was no confusion, and they were led in to land one after the other with the utmost precision.

Several "Farman" monoplanes of a type unfamiliar at Croydon came in with gold on February 6, and there was a Swissair tri-motor Fokker with C.H. marking and a number instead of registration letters. I believe this was the first aeroplane of that company to land at the Airport of London. Its cargo was a ton of gold.

Mr. W. Hitchcock, manager of the Shepherd's Bush Gaumont-British Studios, was a victim of the recent disturbances in Paris. It seems he received a bullet in the arm and was knocked down and trampled under foot by a panic-stricken crowd which suddenly surged into the quiet street he was crossing. As usual in such cases, doctors advised air travel, and Mr. Hitchcock made a remarkably tranquil journey from Paris in a "Heracles" aeroplane piloted by Capt. Perry, who took every precaution to give a smooth crossing.

Last Thursday was exceptionally clear weather, and Capt. Rogers, of Imperial Airways, Ltd., reported blue sky without a cloud so far as the eye could see, a rare occurrence this winter.

The boundary fencing all round Croydon is being painted in alternate black and white sections. Before this change it was plain grey galvanised iron of a colour which easily melts into the background in certain conditions of mist. It is said that the new distinctive pattern is visible for a considerable distance by pilots approaching the Airport. Several other improvements are being undertaken. The fumed oak obelisk covered with clock faces which stood in the centre of the Airport Main Hall is being converted into something really useful—a central newspaper kiosk. The Post Office is being enlarged, which is very necessary, because when machines come in everybody wants to send telegrams, buy stamps and change foreign money. A capacity to cope with normal business is not enough at an airport where things happen in a series of "short rushes."

Owing to the adoption of big motor coaches of 25-seat capacity, the original space allotted for passenger cars to get in and out of the baggage and mail yard, has become inadequate, and numerous gems of verbiage exchanged between rival drivers, when two coaches would not go into one yard have been the result. We shall miss these swift Cockney witticisms in future, for a grove of trees which promised to overshadow the Airport in the fullness of time has been sacrificed and the space is to become concrete. These regular drivers, by the way, can do the most

astonishing things with their huge coaches with perfect safety. They know every inch of the road between the Airport and their London terminus. The speed of these coaches has to be kept well within the limit of time in which the journey could be accomplished because passengers who find no fault with 125 m.p.h. in the air complain bitterly if they are driven fast between London and Croydon.

Monday, February 12, was a day of thick fog at Croydon, and no machines landed at the Airport all day. One company, the Royal Dutch Air Lines, whose terminal in Holland remained clear, was nevertheless able to operate all four services in and out of England. The early morning machine left Croydon in thick fog, and was in clear sunshine a few hundred feet up. The inward morning machine landed at Biggin Hill and cleared outwards from there at midday, and the afternoon inward machine landed and discharged passengers and freight at Gravesend.

On Monday, probably for the first time on record, some forty passengers were cleared inwards at Gravesend, and machines of British, French, Dutch, Belgian, and German nationality sought refuge there and "put up" for the night. This is one more argument in favour of what FLIGHT has always advocated, namely, a number of alternative airports to Croydon for bad weather. These should form an integral part of the whole traffic control scheme and should, of course, be provided with every possible facility.

A. VIATOR.

HESTON

MR. GUY ROBSON recently made a return trip to Cannes in very good time in a borrowed "Gull" ("Gipsy"), his own being out of commission as the result of a forced landing on the way home from the Oases Meeting. He left Heston on Friday, the 2nd, and arrived at Cannes the same evening. The return trip on Monday was also made in a day, leaving at 8 a.m. and arriving at Heston at 4 p.m.

Mr. Gerald Fenner Burgoyne, well known in the wine industry, and Miss Ernestine Marie Shirley, left Heston at 4.30 p.m. on the 7th, after their wedding at the Savoy Chapel. They flew to France in a "Puss Moth," piloted by Capt. Ledlie.

On Monday, February 5, Dr. W. S. Garden, the Manchester cancer specialist, who worked for some time under Dr. Bendien, the Dutch specialist, found it urgently necessary to consult his former chief. He accordingly chartered from Airwork at Manchester a "Gull" (Napier "Javelin") and made the return journey to Rotterdam via Heston in a day.

The flying times and mileage of this fast day's work are given below:—

Manchester, dep. 07.50 a.m., arrive Heston 09.05 a.m.; 1 hr. 15 min.; 162 miles. Depart Heston 10.15 a.m., arrive Rotterdam 12.20 p.m.; 2 hr. 5 min.; 231 miles. Depart Rotterdam 1.15 p.m., arrive Heston 3 p.m.; 1 hr. 45 min.; 231 miles. Depart Heston 3.20 p.m., arrive Manchester 4.45 p.m.; 1 hr. 25 min.; 162 miles. Total time, 6 hr. 30 min. Total mileage, 786.

Hastings Airport

THE Town Council of Hastings has decided to lay out land at Pebsham Farm, on the western boundary of the borough, as a municipal airport at an estimated cost of £40,000.

Romford and Gravesend Customs Aerodromes

ROMFORD (MAYLANDS FARM) and Gravesend (Chalk) aerodromes have been approved as Customs aerodromes for the clearance of passengers and goods. It should be noted that Romford (Maylands Farm) Airport is suitable for use only by certain types of aircraft. In all cases of doubt, prior application should be made to the Aerodrome Control (telephone, Romford 1700; telegraphic address, "Maylands Aerodrome, Romford"). In view of the fact that Customs facilities are not continuously available at Gravesend Airport, prior notification that such facilities are required (stating the date and time) should be made

to the Aerodrome Control (telephone, Gravesend 1400-1; telegraphic address, "Airport, Gravesend"). Except in case of emergency, the notice should be sent sufficiently in advance to enable the Customs authorities to be informed not later than 5 p.m. on the working day (i.e., any week-day other than a public holiday) immediately preceding the day on which facilities are required.

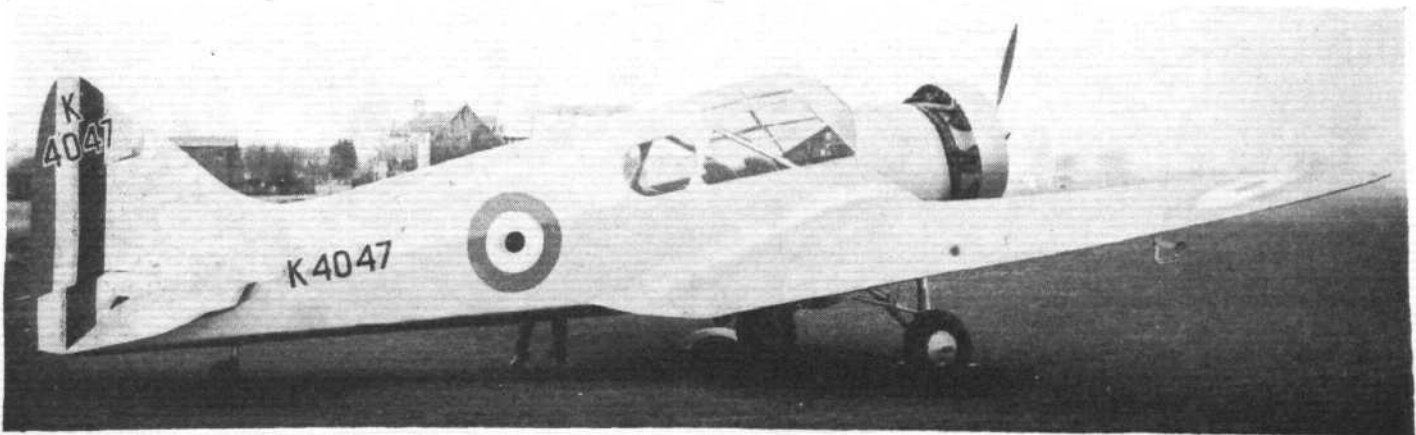
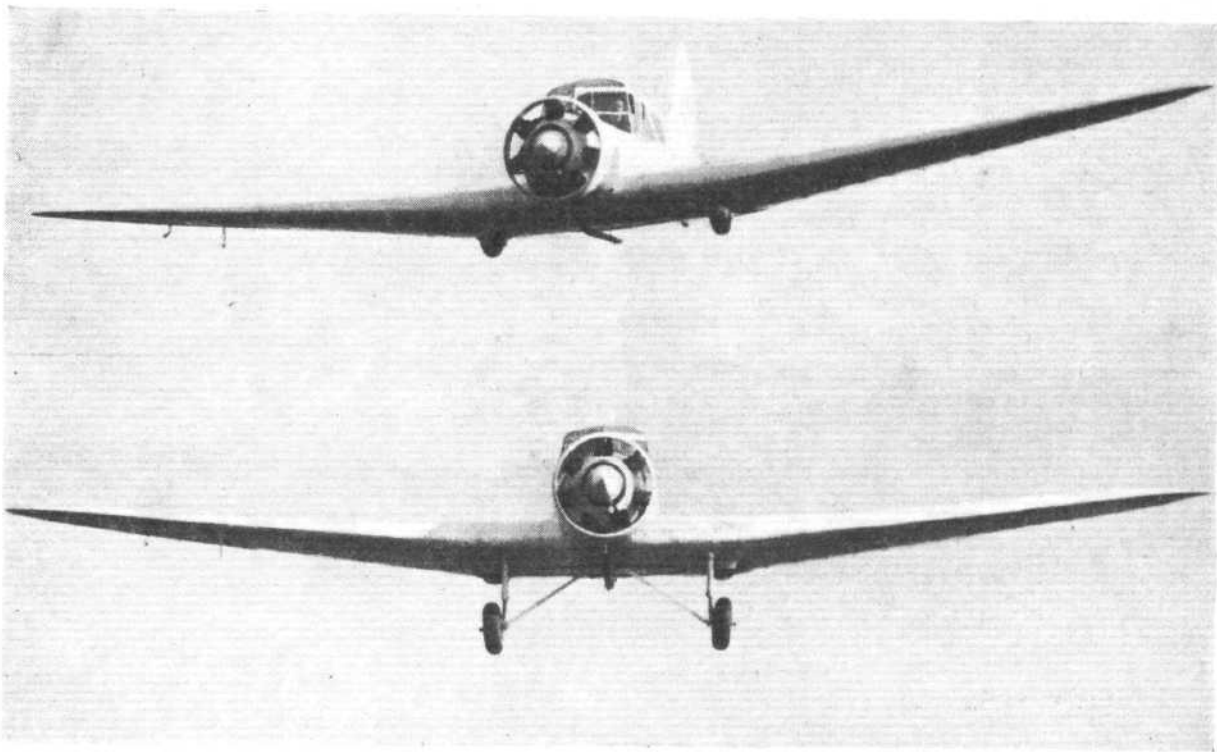
Aberdeen's aerodrome

It is reported from Scotland that Aberdeen is shortly to have an aerodrome. The site is at Dyce, a few miles north of the city, where the work of levelling the ground and erecting buildings is proceeding. Already a hangar and pavilion are nearly completed.

Yarmouth landing ground

THE owner of this landing ground particularly asks that it should not be used until after June, as it is down to hay until then. Notice will be given when it is ready for use again.

SPEED WITH COMFORT



FOR FAST TRAVEL : The ground views show an Airspeed "Courier" ("Lynx IV") which has just been delivered to the Royal Air Force, presumably for communications work. In the centre, our photographer shows what the "Courier" looks like with the undercarriage up and down. This machine is for Commercial Airways, Ltd., which operate from Abridge Aerodrome, Essex. (FLIGHT Photos.)

AIR DISARMAMENT IN PARLIAMENT

ON Tuesday, February 6, Sir John Simon, Foreign Secretary, introduced a debate on disarmament in the House of Commons. He described to the House the recent steps taken and the present position. He said that this country had a special interest in the matter, for it was certain that if a satisfactory disarmament agreement could not properly be arrived at, we should have to face the question of the state of our own arms, which stood at a level which would have to be re-examined if we were to live in a world of unlimited armament. Time, he said, was running against the friends of disarmament. When he said that all nations would not at once abandon all weapons denied to Germany by the Treaty of Versailles, an hon. member asked, "Why not?" Sir John replied, "If anyone pretends or professes that this is the immediate practical solution, well, then, he is preferring the luxury of his own illusion to the opportunity of supporting a practical plan." With regard to air armaments, he said:—

"In regard to air arms, it is true that His Majesty's Government urge that the States at present not entitled to possess military aircraft should not claim this right pending the result of the inquiry into the possibility of the complete abolition of military aircraft which was proposed, and very largely supported, in the Draft Convention. It does seem to His Majesty's Government that if Germany were to be given permission to set up a military air force at the very moment when the possibility of complete abolition is being discussed, that manifestly would not be to the advantage of that most important investigation. (Hear, hear.) Germany, with her vast highly developed civil aviation, could play an important part, but we provide that if at the end of the two years a decision has not been reached on the question of abolition, then undoubtedly it is necessary to face facts as they will be, and this is an improvement, or at least a change, in regard to the Convention."

"While the Draft Convention made no provision for military aircraft for Germany during the five years' life of the Convention, the memorandum, having regard to what has passed since, lays down that if absolute abolition of military aircraft is not reached at the end of two years, Germany will be entitled to begin building military aircraft herself, and during the next eight years the necessary reduction or increase will take place and the principal air Powers will reach what is equality in military aircraft. That point is one of very great difficulty and of immense importance."

Mr. Attlee, who spoke for the Labour Party, said that this White Paper, in the main, was a proposal for the rearmament of Germany. In effect, we were going again to say that Germany should have an army and an increased army. We agreed, first of all, that a Commission should sit for the abolition of hostile air fighting forces, but there was so little faith in that that there were going to be special anti-aircraft guns to cover the two years during which the Commission were deliberating. It was perfectly

obvious from that that we did not really believe that we were going to get the abolition of air forces. Sir H. Samuel (Liberal) also criticised the Government.

Sir Austin Chamberlain said that he could not support the suggestion that we and other nations should be required to disarm down to the level imposed by the Treaty of Versailles on the vanquished Powers. He asked if the purpose of disarmament was to secure peace, not merely abstention from arms, but the maintenance of friendly relations, or was it only by diminishing arms to give licence for other forms of attack?

Capt. H. Balfour, who said that he was not sure that aircraft had brought any happiness to the world, and that if it could be made a world-wide criminal offence for any man to leave the ground in a mechanical contrivance, he would vote for such a policy, asked Mr. Eden whether we were entitled legally and morally to raise new squadrons before the Draft Convention was signed, and Mr. Eden assented.

INADEQUATE DEFENCES OF GREAT BRITAIN AND THE EMPIRE

On the next day, February 7, Mr. Clarry introduced a motion drawing attention to the growing disparity in armaments of the United Kingdom in relation to other Powers. He said that nations with greater strength in the air than we had not a tithe of our responsibilities.

In the course of the debate, Capt. Cunningham-Reid said that he disagreed with the school whose slogan was "Attack is the best form of defence." He said that an aeroplane had just been constructed in this country that could climb to something over 20,000 ft. in a little over nine minutes. It was a single-seater capable of carrying two machine-guns, and its price was extremely reasonable as compared with the ordinary bomber necessary for reprisals. The new machine could not be used for raiding because it was unable to carry sufficient bombs and its range was limited. A fleet of these defensive machines could intercept the enemy 20 minutes after the warning was given that the enemy was approaching our shores. This would give protection without aggression and would lead to economy because more expensive armaments could be dispensed with.

Mr. Churchill said that when we had a Navy we could work things out on our own line, but we could not do that now because "the cursed, hellish invention of war from the air" had revolutionised the position. It was not a question of what we liked, but one of safety. We should get rid of the Treaty of London and regain our freedom of naval design. We should have an Air Force at least as strong as that of any Power who could get at us. It would be advantageous if the problem of the co-ordination of the three Services were studied from a central point of view.

Mr. Baldwin, Sir H. Samuel, and other members spoke, and the motion was talked out.



Old sky-dogs

EIGHT of the senior pilots of Imperial Airways—Capt. Dismore, Horsey, Jones, Perry, Rogers, Walters, Wilcockson, and Youell—have, since they first began flying, now spent a total of 66,301 hours in the air.

Capt. O. P. Jones, who, bearded and imperturbable, has been called "the Captain Kettle of the air," has 9,806 flying hours to his credit.

Another of these merchant skippers of the air, Capt. H. J. Horsey, who is an expert pilot of flying boats as well as of big multi-engined landplanes, has flown for 9,185 hr.

Capt. A. B. H. Youell's figure for time spent in the air has now reached a total of 8,600 hr. Capt. Youell, who was keen upon flying from boyhood, and who was apprenticed to one of the early flying schools, learned to pilot an aeroplane when he was sixteen years of age. During the war he was out in France, fighting enemy aircraft. Then, when peace came, he threw himself enthusiastically into civil aviation, and now his figure for time spent in the air has reached the total quoted above.

Prominent on the list is Capt. W. Rogers, a genial,

popular little pilot who is known to his friends as "Rodge." After seeing war service with several squadrons of the R.A.F., Capt. Rogers became an airway pilot in 1920, flying the twin-engined machines which were the forerunners of the giant four-motored craft of to-day. Now his time in the air stands at 8,144 hr.

Capt. A. S. Wilcockson, who started regular flying on the cross-Channel commercial air lines in November, 1919, has completed a total of 8,081 hr. in the air. Capt. Wilcockson flew for 580 hr. in the R.A.F. during the war, after which, for several months, he was one of the pilots of a pioneer air mail between Folkestone and Cologne.

Capt. H. H. Perry, who gained considerable experience as a pilot in the early days of civil aviation, joined Imperial Airways in 1927, and has flown for a total of 7,760 hr.

Capt. F. Dismore, whose figure for flying hours stands at 7,475, gained his certificate as an aeroplane pilot as far back as 1913, and has been flying ever since, while Capt. L. A. Walters, whose flying hours now total 7,250, began flying in 1918, and, prior to joining Imperial Airways in 1924, had some 1,100 hr. in the air to his credit.

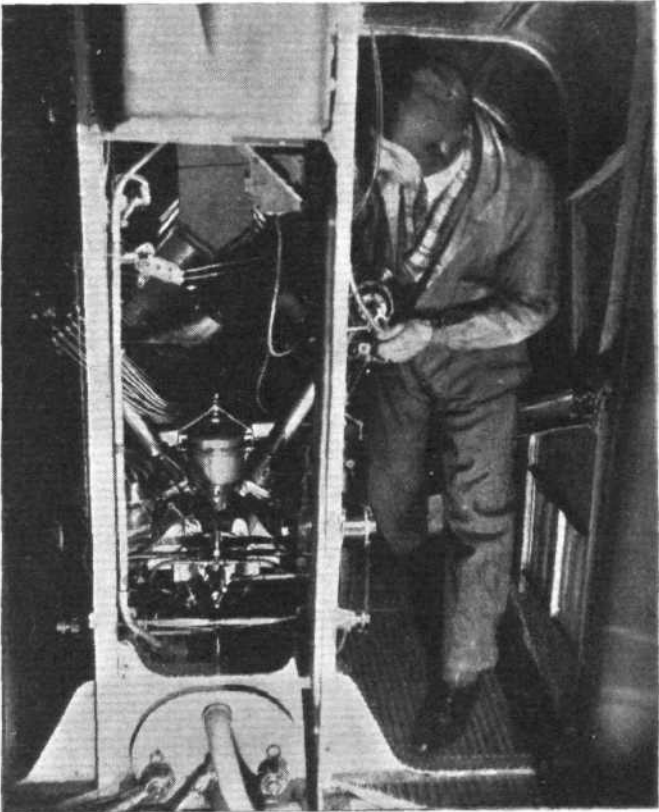
NEW AIRCRAFT



The Lioré et Olivier Bomber : Accessible Engines

ACCESSIBILITY of the engines of large aircraft while in flight is a problem that has occupied the minds of designers for many years. About ten years ago, the Boulton & Paul "Bodmin" and the Parnall "Possum" were built with engines in the fuselage with gear drive to outboard airscrews. In recent years it has been possible to attend to the engines of certain thick-winged monoplanes, as, for example, the Junkers G.38, while in flight. The Lioré et Olivier all-metal, four-engined long-range night bomber illustrated herewith is known as the type 30. Either 650 -h.p. Hispano-Suiza 12 N br engines or Renault 500-h.p. 12 Jb's may be fitted. With the former engines the machine is known as the type 301, and with the Renaults as the 300, according to the French system of numbering Service aircraft. In each case the engines are mounted in tandem pairs below the wings, and, owing to the width of the nacelles, they may receive attention during flight. The main particulars applying to the Lioré et Olivier type 30 are as follows:—Span 124 ft. 7 in., length 78 ft. 8 in., wing area 1,990 sq. ft., weight empty 18,920 lb., normal loaded weight 30,800 lb., maximum permissible loaded weight 36,300 lb.

ACCESSIBILITY : The upper illustration shows the Lioré et Olivier 301 bomber. Note the undercarriage. In the illustration on the right we see one of the Renault engines (in the type 300) receiving attention.



The Latest Douglas "Dolphin"

THE "Dolphin" is by now well known to readers of FLIGHT. Its excellent service in the U.S. Army, Navy and Coast Guard is also famous. The type was originally produced with two 300-h.p. Wright "Whirlwinds," but recently two Pratt & Whitney "Wasp" S.C.-1's (450 b.h.p. at 6,000 ft.) have been fitted as an alternative to the "Whirlwind," with a large increase in the performance of the machine. A military version of the "Dolphin" has also been produced. On this model, the body upholstery, soundproofing, carpets, lounge chairs and miscellaneous furnishings are omitted and simpler installations better suited to military use are substituted. The saving in weight amounts to approximately 300 lb. The "Dolphins" supplied to the U.S. Army, Navy and Coast Guard are equipped for a variety of duties, including transport, wire-

less navigational training target towing and ambulance work. When fitted for offensive duty the "Dolphin" may be fitted with a 0.30 calibre machine gun on a special mounting in the bow operated from the hatchway in the forward baggage compartment. A similar installation may be provided at the rear of the entrance hatchway aft of the wing. The normal ammunition provision for each gun is 485 rounds. A bomb load of 584 lb. comprised of bombs of various sizes may be carried in two type A-3 racks mounted under the wings. The A-3 rack is designed to carry five 25-lb. bombs, three 50-lb. bombs, two 100-lb. bombs, or a combination of all three sizes. The normal load for each rack is 240 lb. However, a maximum load



AN EFFICIENT AMPHIBIAN : A Douglas "Dolphin" supplied to the U.S. Navy.

DOUGLAS "DOLPHIN"			
	AMPHIBIAN	FLYING BOAT	
Gross weight	9,500 lb.	9,500 lb.	
Disposable load	3,186 lb.	3,764 lb.	
Top speed, sea level	148 m.p.h.	158 m.p.h.	
Top speed, 6,000 ft.	154 m.p.h.	165 m.p.h.	
Cruising speed, 75 per cent. power, sea level	132 m.p.h.	141 m.p.h.	
Cruising speed, 75 per cent. power, 6,000 ft.	140 m.p.h.	150 m.p.h.	
Landing speed, sea level	65 m.p.h.	65 m.p.h.	
Rate of climb, sea level	880 ft./min.	920 ft./min.	
(With two-position airscrew)	950 ft./min.	990 ft./min.	
Rate of climb, 6,000 ft.	885 ft./min.	900 ft./min.	
(With two-position airscrew)	930 ft./min.	970 ft./min.	
Service ceiling	18,500 ft.	19,300 ft.	
(With two-position airscrew)	19,300 ft.	20,100 ft.	
Absolute ceiling	20,300 ft.	21,000 ft.	
(With two-position airscrew)	21,000 ft.	21,800 ft.	
Absolute ceiling on one engine	2,900 ft.	3,700 ft.	
(With two-position airscrew)	3,600 ft.	4,400 ft.	
Fuel load for 400-mile range	138 gall.	131 gall.	
Payload for 400-mile range	1,910 lb.	2,520 lb.	

of 292 lb. may be carried. "Selective" and "salvo" release levers may be fitted in the pilot's cockpit or in the front or rear gunners' compartment.

The Martin 123 Bomber

FEW military aircraft have caused more comment in the U.S.A. in recent years than the Martin 123 bomber. Only the experimental model of this aircraft has been tested, and complete detailed weights and performance figures are not yet available, but it is claimed to have shown a superiority in maximum speed and rate of climb over any bombing type so far developed in America. It has been repeatedly rumoured that the top speed of the machine is about 200 m.p.h. A quantity of aircraft of this type is now being manufactured for the U.S. Government for Service tests.

The machine is a mid-wing cantilever monoplane with the wing in three sections. The centre section is built into the fuselage and carries the two engine nacelles in the leading edge. The outer sections are detachable.

The wing structure is of riveted aluminium alloy with highly-stressed fittings of heat-treated steel, and aluminium alloy stressed skin covering. Riveted aluminium alloy fuel and oil tanks are carried in the wings. Balanced ailerons are fitted.

The fuselage is a riveted aluminium alloy monocoque structure, the shear loads being taken on the smooth side skin, and the top and bottom compression loads by corrugated sections of sheet metal covering.

The structure is in three separable units, the nose section, the centre section, built round the centre section wing, and the tail section. Bombs are internally stowed in a bomb bay closed by doors controlled by the bomber, or, in an emergency, by the pilot. The fin and tail plane are of full cantilever structures of riveted aluminium alloy with aluminium alloy sheet covering. The rudder and elevator are fabric covered and are fitted with trailing edge "tabs" for trimming, which are adjustable in flight from the pilots' cockpit.

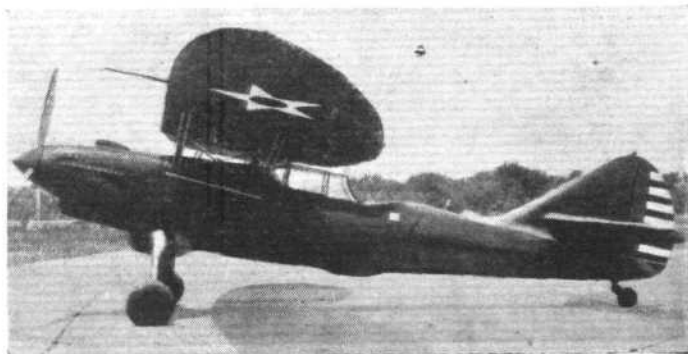
A mechanically retractable landing gear is fitted with the retracting controls in the pilots' cockpit. Oleo shock-absorber struts and brakes are used and the tail wheel is of the swivelling type.

Part of the Martin bombers to be delivered to the U.S. Government will be equipped with two Wright "Cyclone" geared and supercharged radial engines, and the rest of the machines will use two Pratt & Whitney geared and supercharged "Hornets." Electric inertia starters are provided. The airscrews are of the three-bladed adjustable-pitch type.

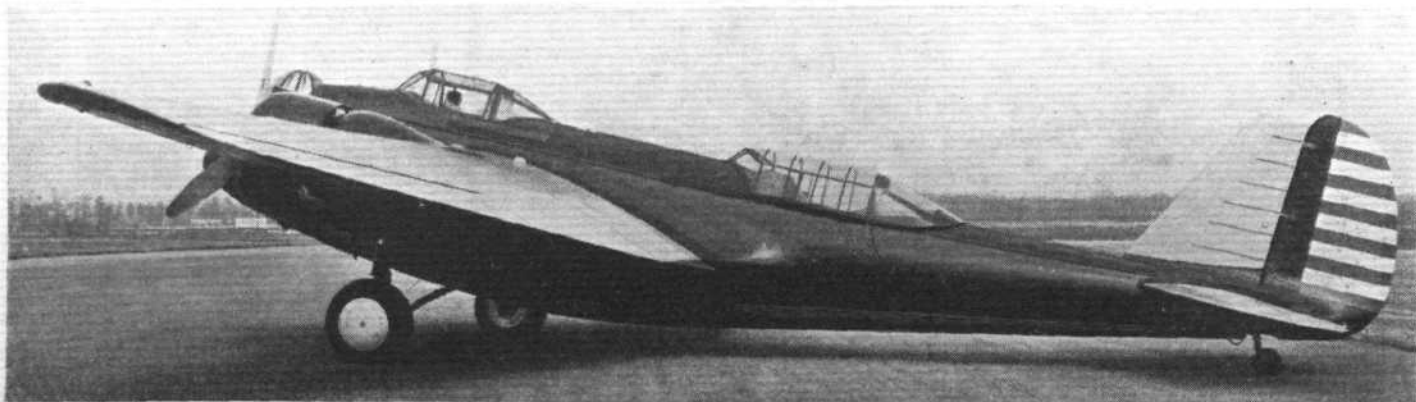
In the nose of the fuselage is a cockpit equipped with

bomb sights, bomb-release controls and movable gun mounting. A transparent cupola, one section of which is omitted to allow for a machine gun, revolves with the gun ring. The pilots' cockpit is just forward of the leading edge of the wing. A compartment for the wireless operator is inside the fuselage aft of the pilots' cockpit. Behind the wings is a third cockpit equipped with auxiliary flight controls and mountings for a movable machine gun on top of the fuselage and for a downward firing gun in the floor.

The Douglas Y10-43



SIMILAR in general design to the Douglas Y10-31, this new observation aircraft for the U.S. Army Air Corps incorporates a number of improvements. The "gull" wings of the earlier type have been dispensed with and wire-braced high wings have been fitted in their place. The machine is fitted with a Curtiss "Conqueror" V-1570 direct-drive Prestone cooled engine delivering about 650 h.p. A very neat single-strut cantilever landing gear with streamline low-pressure wheels is fitted in place of the older and more conventional split type. The monocoque fuselage is covered with sheet duralumin, as are the majority of aircraft now being built for the U.S. Army Air Corps. Other interesting features are the three-bladed metal airscrew and the cockpit hooding which commences at the pilot's windscreen and finishes half-way over the observer's cockpit. It may be noted in the photograph that there is a deepening of the fuselage under the observer's cockpit. This is to give the rear gunner a good firing position when standing up. Tail plane and elevator are mounted above the fuselage on the fin, probably to avoid blanketing of the rudder during a spin. Performance figures are not available, but it is rumoured that the top speed is in the neighbourhood of 200 m.p.h.



A HOT HOUSE : Two views of the Martin 123 bomber, described above.

ENGINE COWLING

AT the meeting of the Royal Aeronautical Society on February 1, at which Mr. J. D. North read a paper on "Engine Cowling, with Special Reference to the Air-Cooled Engine," Mr. C. R. Fairey was in the chair. In introducing the lecturer, Mr. Fairey recalled that they had listened recently to the story of the development of the air-cooled engine, told by Mr. Fedden. It was generally conceded that a great part of that development had been due to improvements in cowling, and Mr. North was to tell them that evening the story of improvements in cowling.

Mr. North's paper was a long and interesting one. In last week's issue of *FLIGHT* we published a summary of the first part of the paper. The second, and rather more technical, part will be summarised in *THE AIRCRAFT ENGINEER* (Monthly Technical Supplement to *FLIGHT*) on February 22. Extracts from the discussion which followed the reading of Mr. North's paper are given below.

THE DISCUSSION

MR. A. H. R. FEDDEN, who congratulated Mr. North upon the thorough manner in which he had reviewed the important and interesting subject of engine cowling, said he had seen the paper for the first time only that morning, and had not yet had an opportunity to consider it really carefully. Mr. North was one of the first people in this country to appreciate the possibilities of drag reduction by ring cowling on air-cooled radial engines, and had completed much valuable work in this direction.

Mr. Fedden understood from Capt. Barnwell's wind tunnel investigations that there was no engineering difference between the forms of external cowlings known as N.A.C.A. and Townend Rings, and that all our model tests had shown that any reduction in drag due to the fitting of an external cowling round a radial engine was entirely due to a forward component of air force on this cowling, and was invariably accompanied by an increase of drag on the rest of the model. Assuming that these wind tunnel tests were correct, he felt that the N.A.C.A. cowling, with suitably proportioned baffles to the cylinders, was an interesting combination in certain types of machines.

Perhaps Mr. North's remarks on the N.A.C.A. cowling were somewhat severe when he had said that cooling difficulties arose with geared and supercharged engines. The latest Douglas high-speed passenger machine was powered by two geared and supercharged 700-h.p. "Cyclone" engines, and it was maintained that without the N.A.C.A. cowling it would be impossible to cool adequately under the particularly arduous test conditions which the Department of Commerce tests called for. This machine had to take off from an aerodrome at an altitude of 4,943 ft. with one engine out, and to climb over 8,000 ft. with manifold pressures rising as high as 3 lb. per sq. in.

What had not been fully realised in this country was the importance of correctly designed inter-cylinder baffles, and the great effect of fuselage shape.

The great importance of the fuselage had recently been demonstrated most convincingly by a test in which a given N.A.C.A. cowled engine cooled adequately on a machine with nicely faired nacelles; but when the same engine and cowling were installed in another single-engined machine with an unsuitable body shape and humps, the engine overheated very seriously. The cylinder temperatures were about 60 deg. higher than on the twin-engine nacelles.

Another point of interest was that velocity measurements in the neighbourhood of the cylinder barrels might prove unreliable, and in the United States it was usual to use the difference in total head in front of and behind the inter-cylinder baffle as a measure of cooling air speed. In the case mentioned, the differential head was 4 in. of water during climb at 100 m.p.h. with the correct fuselage, and only 1½ in. of water at the same speed on the second machine. In level flight cruising, the differential head was 12 in. of water on the first machine. It was interesting to note Mr. North's statement that struts, cylinder baffles, etc., within a Townend Ring had a negligible effect on the total drag, and further information on this point would be appreciated. Mr. Fedden would be glad to feel that this was so; but he suggested that the statement was contrary to the results of practical full-scale tests made in this country and America, where it had been found that inter-cylinder baffles improved cooling, but

increased drag with a Townend Ring, but that they improved cooling and did not increase drag with an N.A.C.A. cowl in front of a properly proportioned body.

Whilst fully appreciating the value of the Townend Ring, and acknowledging the force of Mr. North's remarks regarding field of vision, field of fire for forward guns, etc., it was worthy of note that, whereas Townend Rings were used to some extent in the United States, more generally on single-engined pursuit machines, the tendency with the latest high-speed machines was to have complete N.A.C.A. cowling, especially where there were two engines mounted in wing nacelles. It was felt that the N.A.C.A. cowling was more valuable than the Townend Ring from the point of view of drag, and that, provided the fuselage was correctly designed and suitable inter-cylinder baffles were installed, the engine could be cooled more satisfactorily.

With reference to Mr. North's remarks on the effect of ring cowling on carburation, it was agreed that any form of cowling round a radial engine altered the configuration of the air stream, and that it was necessary to have a design of carburettor in which the pressure balance effects were not altered; this matter had been dealt with on the carburettors of recent type Bristol engines.

Mr. Fedden was fully alive to, and in agreement with, Mr. North's view in regard to the importance of suitably ring cowling air-cooled radial engines, but he was hoping that the aircraft designer would give as much attention to the body immediately behind the cowling as to the cowling itself. For the future, he suggested that controllable cowling would be absolutely necessary, and it was interesting to note, in connection with the patent applications given in the paper, that Patent Specification No. 11315 was granted to Mr. Granville Bradshaw in 1917, which provided for a cowling practically identical with the N.A.C.A. type, and with controllable flaps to meet climbing conditions, combined with a really close cowling with inter-cylinder baffles.

MR. H. C. H. TOWNEND, discussing the Townend Ring, and the rough rule given by Mr. North in the paper for estimating what ring angle was likely to give success, put forward another point of view, which supported Mr. North's statements. He illustrated it by means of slides.

The first slide showed a model tested in the wind tunnel. The model was made in two dimensions, i.e., the body was represented by a thick symmetrical aerofoil, with a row of knobs to represent the cylinders and a straight aerofoil to represent the ring.

The second slide indicated the air flow around the body in the absence of both the cylinders and the ring. The cylinders were dotted in in the position which they would eventually occupy, and the ring was also shown in the position which gave minimum drag. He pointed out that the section was lying with its no-lift line practically along the local streamlines, so that if the engine only were removed, the ring would not be expected to have much influence on the flow around the body. When the engine was introduced, it immediately put the ring up to a high lift coefficient; and it was possible that if the streamlines could be obtained when the model was mounted in the wind tunnel without the engine on it, a very good idea could be obtained of the angle at which the ring ought to be set when the engine was eventually put in its proper place.

With regard to the point made in the paper that the bulbous nose was a good thing, he asked if Mr. North could state his views as to the reason for that.

Discussing the statement that sometimes the effect of the ordinary crankcase cowling was to warm up the crankcase and reduce the cooling of it, Mr. Townend asked if it did not also probably make the cylinder heads somewhat cooler.

MR. HOFMAN, after assuring Mr. North that the information contained in the paper was welcomed and would be studied very carefully, suggested that Mr. North had been rather hard on the N.A.C.A. cowling, particularly in his remarks as to the obvious advantages of the Townend Ring over the N.A.C.A. cowling. The difficulty about the latter interfering with gunfire had been overcome in several cases by the slight readjustment of the position of the gun, and a large number of military planes had been built in the United States with N.A.C.A. cowls fitted, there being no interference with vision.

With regard to cooling, Mr. Hofman referred to some

tests on similar installations (with supercharged and geared engine), the one having no ring cowl and no baffles, whilst the other had N.A.C.A. cowl and baffles. In the latter case there was a reduction of nearly 50 deg. F. in the maximum cylinder head temperature and an increase of speed of 15 m.p.h., under conditions of constant power and r.p.m., constant fuel consumption and constant density altitude.

Mr. HOLLIS WILLIAMS said there was one interesting point in the paper which rather revised his ideas of how rings and the N.A.C.A. cowling worked. It was interesting to see working out in full scale a physical phenomenon which one knew must be true, *i.e.*, that if a ring cowling were working properly, symptoms of vibration, wind-screen chatter, and so on, would disappear, and there would be laminar flow. One could feel the warm air down the sides of the fuselage, and that was one of the best methods of telling whether a cowling was working properly. It had always seemed to him that to secure the peculiar phenomenon of laminar flow it was necessary to rely on the sluicing of the air at the back of the ring. There was a high-velocity air stream rejected from the back of the ring, and that tended to pack the air down on to the body and produce the laminar flow.

It had been stated by Mr. North that in tests carried out in America, where the slots had been filled up behind the N.A.C.A. cowling, the drag was reduced. That upset the ideas which he (Mr. Hollis Williams) had had; it meant that the war-time cowlings were as good as anything now produced, and he was not sure that this was not a fact. The point was whether the slot was absolutely necessary for the high-speed sluicing which gave the laminar flow.

Mr. NORTH, replying to the discussion, suggested that part of the difficulty which had arisen was due to the unavoidable doubt as to what was an N.A.C.A. cowling. He had quoted extracts from the statements of the N.A.C.A. at the time they had produced their cowling, in order to try to show what was in fact in their minds prior to the publication of Mr. Townend's results, and what they had produced. The line of the cowling was a continuation of the shape of the fuselage. It was, therefore, not surprising under those circumstances that the filling up of the slot, which was a horizontal and not a vertical slot, had the effect of reducing resistance. But if one filled up the slot of the Townend Ring the drag increased tremendously. One could regard that as being the fundamental difference between the N.A.C.A. cowling and the Townend Ring.

Then Mr. Fedden has referred to the Douglas fitted with the N.A.C.A. cowling. Mr. North did not know whether it fell within the definition which the N.A.C.A. themselves had laid down in their reports. When he had said that the N.A.C.A. cowling caused other troubles as

well as heating, he was quoting Mr. Fedden. There again, the importance of that was that Mr. Fedden's figures, where he had shown that there had been overheating with the N.A.C.A. cowling, arose from direct comparisons with some installations of the Townend Ring, and certainly, from what he himself had said on the matter, he had found that the temperatures were considerably greater with the N.A.C.A. cowling than with the Townend Ring. But in these matters one was not dealing with things that were so precise that one could be compared with another.

No doubt there was a very large number of installations which conformed to the original definition of the N.A.C.A. cowling, and which functioned well, particularly at the very high speeds at which the machines were working. When Mr. Fedden had said that there was no engineering difference between the Townend Ring and the N.A.C.A. cowling, because both had a forward component, Mr. North was unable to understand it. The mere fact that both had an upward component was only a sort of manifestation of the pressure distribution and something which was inevitable from the position in which the ring was placed. He did not think the fact that the Townend Ring gave a large upward force and also gave a drag had any more significance than the fact that if one took a slice from a streamline body, the nose might have an upward component, although the back part had a drag; it was a question of cause and effect.

The interesting suggestions made by Mr. Townend with regard to methods of experiment would be very helpful. As a matter of fact, one did not find very much difficulty in hitting off these things in the wind tunnel now; it was much easier intuitively to know how to set about the job than to explain how to do it. He could give some figures with regard to the bulbous nose which would surprise and interest Mr. Townend. Some wings were tested by themselves in free air. With the one-tenth scale polygonal ring, using the bulbous nose, the drag was 18.26 lb., and with the one-fifth scale ring it was 17.72 lb., showing practically no scale effect. When the bulbous nose was removed, the drag was 31 on the one-tenth scale and 22 on the one-fifth scale. So that there was increased drag when the bulbous nose was taken off and a very large scale effect. But he could not give an explanation; this was far more Mr. Townend's province than his own.

He agreed with Mr. Hollis Williams' remarks with regard to the general steadying up of the flow when the ring was functioning satisfactorily.

Finally, commenting on Mr. Fedden's emphasis of the importance of the shape of the after body, Mr. North said there was a great deal in the paper which he had not had time to read at the meeting, and he, too, had referred to the importance of the shape and size of body. He agreed with Mr. Fedden as to the sort of effects produced when there was a badly shaped body behind a ring.

Death of Flt. Lt. R. E. H. Allen

It is with the greatest regret that we have to record the untimely death of Flt. Lt. Ralph Eric Herbert Allen, A.M.I.A.E., M.I.Ae.E., R.A.F.O. After being knocked down by a motor car in Whitehall on Friday, February 9, he died in Westminster Hospital on the following Sunday. Allen was a well-known and cheerful person in aviation circles. He kept his own "Bluebird" at Hanworth and flew consistently for his own pleasure and often, it is understood, for the Metropolitan Police. He was employed at Scotland Yard as an assistant engineer where the extensive knowledge he gained in the Royal Air Force of ground transport vehicles made him very valuable. Born in 1892, he joined the R.N.A.S. in 1914, and served throughout the war in France and on Coastal Defence duties. From 1919 to 1925 he was an engineer officer and instructor in the R.A.F., and subsequently worked at the Air Ministry until 1928. He also designed and patented many specialised vehicles in connection with aviation. His loss will be felt keenly both by his employers and his many friends; to them we offer our sincerest sympathy.

Mr. Shackleton's illness

His many friends will be sorry to hear that Mr. W. S. Shackleton recently had to undergo an operation. He is at present in the London Clinic, 20, Devonshire Place, London, W.1, where he is, at the time of writing, progressing favourably, and there is, we are informed, no cause to anticipate complications. For the benefit of

any of our readers who might like to make inquiries, the telephone number of the London Clinic is Welbeck 4444.

Major Mealing's accident

MAJOR MEALING's marriage to Miss Cournéde has unfortunately had to be postponed owing to an accident, Major Mealing having fallen from a ladder and hurt his spine. We hope that his injuries will prove to be less serious than they seem, and that he will soon be able to leave the Nightingale Nursing Home, Twickenham.

U.S.A. air mail contracts cancelled

ON February 9, President Roosevelt, through the U.S. Postmaster General, issued an order cancelling all domestic air mail contracts on the ground that sufficient evidence of collusion and fraud in securing them was believed to exist. The Army Flying Corps was placed at the disposal of the Postmaster General for the carrying on of the air mail services. Col. Lindbergh sent a telegram to the President, in the course of which he said: "Your order cancelling all air mail contracts condemns the largest portion of our commercial aviation without a just trial." It "does not discriminate between the innocent and the guilty, and places no premium on honest business." According to Col. Lindbergh, America has been leading the world in commercial aircraft, engines, equipment, and organisation of air lines, and the greatest part of this progress has, he says, been brought about through the air mail, subsidised by the Government.

Correspondence.

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

ON SELLING AIRCRAFT

[2911] I have just read with interest your article "On Selling Aircraft," by Mr. C. R. Fairey, and whilst I have a very great respect for Mr. Fairey's opinions, I cannot allow this passage to pass without some comment.

"Despite the varied types of aircraft offered them by our manufacturers, they persisted in buying the standardised products of the U.S. He felt that the trouble was that they themselves did not know what they wanted."

Buyers in Australia know what they want and the majority of them want to buy British. Unfortunately, Britain does not supply what we want at the right price.

Recently I wrote to a British manufacturer for particulars of a single-engine six-passenger machine. The cost of landing this machine in Australia would have been approximately £6,000. A friend of mine was recently quoted a similar machine of American manufacture to be landed here under £1,000. Perhaps Mr. Fairey would be able to explain the very great difference.

Just after the war, Australia was becoming generally motor-car minded, with a result that a desire for motor cars was created in the mind of the public, the result being that many thousands of motor cars were purchased during the following decade.

Unfortunately, Britain did not cater for the wants of the majority of these buyers—America did.

To-day Australia is becoming generally air minded. This particularly applies to commercial men, and I might predict that within the next decade many aeroplanes will be purchased by Australia. My advice is let these be British.

With regard to Mr. Fairey's remark as to persistence in buying standardised products of the United States, as far as aircraft are concerned these are practically prohibited by the Government, but if these restrictions were lifted the result would be that Australia, as was the case with motor cars, would purchase from America.

Britain to-day builds many aircraft which are suitable to latent requirements in Australia, but the price is out of all proportion to machines of foreign origin, so potential

users of aircraft in this country must remain on the ground until we are able to obtain machines at a reasonable price.

Possibly I shall be considered a little unpatriotic; however, patriotism has to be weighed in the scales with £ s. d.

PHILIP H. VYNER.

Mosman, N.S.W.
January 2, 1934.

HOME PRODUCED FUELS

[2912] May I add something to the remarks made under the above heading by Mr. J. W. Clarke, of the National Benzole Co., Ltd.?

Before the war I used in my car benzole, either neat or mixed with petrol, because I had raised the compression in stages to such an extent that it would not run on pure petrol. I was, in consequence, fully appreciative of the merits of benzole as an anti-knock fuel.

During the war I happened to be in the Engine Branch of the Technical Department of the Air Ministry, and in the course of my service there we had to raise the compression of the Hispano-Suiza engines, with which I was chiefly concerned, to increase the engine's capabilities at high altitudes, and incidentally to raise the power. We had to issue an instruction to pilots that they were not to open the throttle fully below 5,000 ft., but this left the seaplane pilots handicapped because they were unable to use full power to "unstuck." Consequently, I suggested that a separate tank of benzole or benzole mixture should be used for taking off and that the pilot should switch over to petrol thereafter. This was done, and later we made experiments with benzole and adopted a 20 per cent. mixture as standard.

Frankly, I stick to benzole mixture for my "Moth" because I have found that using ethyl mixtures does in some cases affect the valves and valve seats. Quite possibly Mr. A. H. R. Fedden has in mind very much higher compression ratios and quite different conditions of operation from those which either Mr. J. W. Clarke or I have in mind.

ERIC W. WALFORD.

Coventry.

February 8, 1934.

Handley Page slots for France

A FEW years ago the British Air Ministry acquired by payment of the sum of £100,000 the rights for the Royal Air Force of the Handley Page Slotted Wing. Since that date the majority of Royal Air Force aircraft have been fitted with that device, with a resultant considerable reduction in accidents arising out of involuntary stalling. The French Air Ministry have now concluded an agreement with Handley Page, Ltd., we learn from the company, and have paid a substantial sum for the similar rights for the French Air Force and French manufacturers to fit the Handley Page Slotted Wing to their aircraft. This decision to purchase by the French Government was taken after very exhaustive trials carried out on French aircraft fitted with the Slotted Wing, these tests fully substantiating the increased safety which the Slotted Wing gives, and confirms the British Air Ministry's wise decision in standardising the fitment on Royal Air Force aircraft. During the flight test on one of the French-built machines structural failure occurred in the engine, which resulted in the loss of the aircrew and part of the engine. The pilot, in his report, stated that it was largely due to the fact that his aircraft was fitted with Slotted Wings that he was able to bring the machine down under control and land it on an aerodrome.

An "Empire Air Day"

WITH the objects of enlarging air-consciousness and of accelerating imperial air progress and development, the Air League is to hold an "Empire Air Day" on May 24 this year, and thereafter annually on the same date. The general idea is to reveal to the public as much as possible of things and activities associated with flying that are usually closed to public view or investigation. Plans are

in hand for opening on Empire Air Day all military and civil aerodromes and aircraft and aero engine factories and workshops. Flying displays and flights will be given. The help of all kinds of civil, military and industrial authorities is being sought and much progress has already been made. Leaders of national thought and opinion, the schools and other educational institutes will be brought in to further the cause of imperial aviation.

Spartan machines abroad

CAPT. G. H. MUIR, the Chief Pilot to the Maharajah of Patiala, has recently written to Spartan Aircraft expressing his complete satisfaction with the Spartan "Cruiser" which has been supplied to the Maharajah, who has also himself expressed appreciation of the machine. In another part of the world, closer to home, Spartan Aircraft have had a further success. Messrs. Bata, boot manufacturers of Zlin, Czecho-Slovakia, have placed an order for the purchase of a number of the same machines for use in connection with their air transport organisation. The same company also used a "Cruiser" for an 8,000-mile business tour of Europe, Africa and Palestine. This contract is especially worthy of note since it was obtained after a keen competition held in Czecho-Slovakia and in the face of international competition.

Airspeed progress

WE are informed that the demand for Airspeed "Couriers" for fast work on internal airlines is growing rapidly. London, Scottish & Provincial Airways have four on order, another is ready for delivery to Commercial Airways, Ltd., at Abridge, two with "Cheetah" engines are being built for India, and certain other firms are at present negotiating with a view to adopting this type.

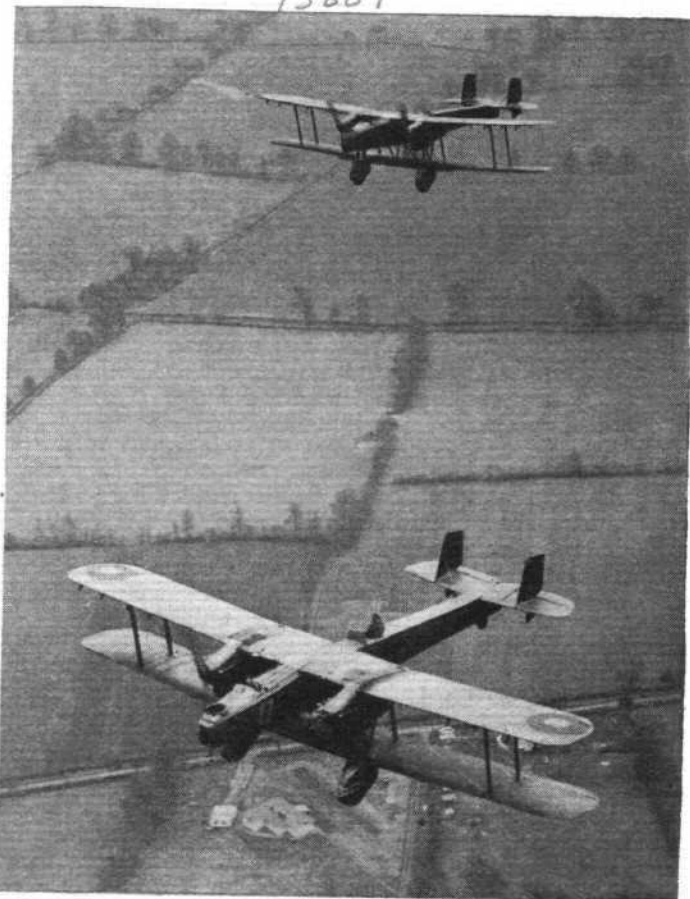


"HEYFORDS" FOR THE R.A.F.

THE photographs on this page show a batch of three Handley Page "Heyford" night bombers delivered, last week, to the R.A.F. Our photographer flew in the third machine and took his photographs from the "dustbin," the retractable and rotatable turret for a Lewis gun beneath the fuselage of the "Heyford." The machines are part of the new equipment of No. 99 (Bomber) Squadron, Upper Heyford, which for many years has been equipped with Handley Page aircraft of the "Hyderabad" and "Hiniadi" types.

The "Heyford" is the first standard Service type to use a Rolls-Royce "Kestrel III." This engine will be the fourth type of "Kestrel" adopted by the R.A.F., those at present in use being the Series 1B (high compression unsupercharged, geared 0.632-1), II.M.S. (moderately supercharged, geared 0.552-1) and II.S. (fully supercharged, geared 0.552-1). The Series III is geared 0.475-1, and is particularly well suited for use in heavy machines like the "Heyford." Our photographs show the new "kidney" type exhausts which silence the engine and damp the flames for night flying.

Handley Page, Ltd., refer to the "Heyford" as an "express" night bomber. The word "express" applies not only to speed in the air, but speed of refuelling and reloading while on the ground. Although the "Heyford" is not so fast as the latest American twin-engined bombers such as the Martin and Boeing, its excellent powers of manoeuvre, wide field of fire for all three guns, its large load carrying capacity and its ability to operate from small aerodromes make it one of the finest aircraft of its type in existence. Full performance figures are not available for publication, but it is permissible to say that the top speed is 142 m.p.h. at 13,000 ft., the service ceiling is 21,000 ft. and the range is 920 miles.



"HEYFORDS" FOR HEYFORD: Three views of the Handley Page "Heyford" night bombers just delivered to No. 99 (Bomber) Squadron, Upper Heyford. Further details of the "Heyford" were published in "Flight" for July 6, and July 20 last. (FLIGHT Photos.)

THE ROYAL AIR FORCE

London Gazette, February 6, 1934

General Duties Branch

F. B. Chapman is granted a short service commn. as Pilot Officer for five years with effect from and with seny. of Jan. 16; P/O. on probation H. S. Laws is confirmed in rank (Jan. 23); Lt. Com. C. John, R.N., is reattached to R.A.F. as a Flt. Lt. with effect from Jan. 27, and with seny. of Jan. 1, 1933. The follg. Pilot Officers are promoted to rank of Flying Officer:—A. C. Martin (July 26, 1933); A. N. Combe, D. Michell (Jan. 23).

Sqd. Ldr. C. R. Steele, D.F.C., is placed on half-pay list, scale A, from Jan. 17 to 20, inclusive; Sqd. Ldr. F. R. Wynne, M.B.E., is placed on half-pay list, scale B, from June 22, 1933, to Sept. 30, 1933, inclusive. (Substituted for Gazette June 27, 1933.) F/O. M. V. de Satge is transferred to Reserve class A (Feb. 1); F/O. T. H. Wilson is transferred to Reserve, class A (Feb. 1); F/O. J. A. Hankins is transferred to Reserve, class C (Jan. 15); Flt. Lt. W. E. Symonds relinquishes his short service commn. on account of ill-health (Feb. 1).

Stores Branch

Flt. Lt. F. W. Todd is placed on retired list (Feb. 2); Flt. Lt. C. J. Elliott is placed on retired list (Feb. 3).

Accountant Branch

Flt. Lt. R. C. Clayton is placed on retired list on account of ill-health (Feb. 1).

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

F/O. W. F. Bryanton relinquishes his commn. on completion of service (Jan. 6); F/O. A. G. P. Way resigns his commn. (Sept. 21, 1933).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain J. C. Quinell, D.F.C., to H.Q., Western Area, Andover, 16.1.34, on appointment as Sen. Air Staff Officer, vice G/Capt. J. S. T. Bradley, O.B.E.

Wing Commanders: R. F. S. Morton, to R.A.F. Base, Gosport, 28.1.34, for Administrative duties, vice Wing Com. E. B. Beauman. C. E. H. Medhurst, O.B.E., M.C., to Air Ministry, Dept. of C.A.S. (D.O.I.), 1.2.34, for Air Staff duties, vice Wing Com. D. Harries, A.F.C.

Squadron Leaders: A. S. Ellerton, O.B.E., to No. 10 (B.) Sqdn., Boscombe Down, 1.2.34, for flying duties, vice Sqd. Ldr. C. Turner, A.F.C. W. E. G. Bryant, M.B.E., to Armament Group, Eastchurch, 1.2.34, for Armament duties. E. D. Davis, to Armament Group, Eastchurch, 1.2.34, for Armament duties. G. E. Ranson, to R.A.F. Base, Malta, 2.2.34, for Marine Craft duties, vice Sqd. Ldr. H. W. Evens.

Flight Lieutenants: T. N. McEvoy, to No. 43 (F.) Sqdn., Tangmere, 15.1.34, instead of as previously notified, on January 23, 1934. H. M. Whittle, to No. 23 (F.) Sqdn., Biggin Hill, 19.1.34. W. Catchpole, A.F.C., to Administrative Wing, Cranwell, 29.1.34. W. H. Merton, to Aircraft Park, India, Lahore, 9.1.34. R. H. S. Spaight, to Special Duty List, 1.2.34, for duty with the Army. G. H. Vasse, to No. 1 (Indian) Group H.Q., 5.1.34. V. P. Feather, to No. 204 (F.B.) Sqdn., Mount Batten, 14.1.34. E. S. Finch, to No. 501 (City of Bristol) (B.) Sqdn., Filton, 25.1.34. B. H. Godfrey, to Station H.Q., Upper Heyford, 30.1.34. E. A. Healy, to Experimental Section, Royal Aircraft Estab., Farnborough, 29.1.34. W. G. Kentfield, to the Packing Depot, Sealand, 29.1.34. R. W. G. Lywood, to No. 3 Flying Training School, Grantham, 1.2.34. A. H. Willets, to R.A.F. Base, Calshot, 14.1.34. W. T. Holmes, to No. 800 (F.F.) Sqdn., Netheravon, 27.1.34. V. Rees, to Reception Depot, West Drayton, 31.1.34.

Flying Officers: L. F. Sinclair, to No. 501 (City of Bristol) (B.) Sqdn., Filton, 21.1.34. C. A. Washer, to Central Flying School, Wittering, 20.1.34. C. F. Birks, to School of Naval Co-operation, Lee-on-the-Solent, 29.1.34. The undermentioned Flying Officers are posted on 15.1.34, on appointment to temp. commns. on being seconded from the Army:—A. F. Anderson, to R.A.F. Training Base, Leuchars. A. P. C. Hanway, M.C., to Central Flying School, Wittering. A. A. N. Malan, to R.A.F. Training Base, Leuchars. R. B. Pakenham, to R.A.F. Training Base, Leuchars. C. D. C. Boyce, to No. 201 (F.B.) Sqdn., Calshot, 1.2.34. H. St. G. Burke, to Home Aircraft

Depot, Henlow, 1.1.34. D. A. Cameron, to Station H.Q., Donibristle, 1.2.34. T. B. Cooper, to Home Aircraft Depot, Henlow, 1.1.34. G. D. Emms, to Home Aircraft Depot, Henlow, 1.1.34. N. Foster-Packer, to Elect. and Wireless School, Cranwell, 29.1.34. R. G. Shaw, to H.Q., Central Area, Abingdon, 15.1.34. L. E. B. Stonhill, to No. 3 Armament Training Camp, Sutton Bridge, 29.1.34. E. W. Whitley, to No. 17 (F.) Sqdn., Upavon, 31.1.34.

Pilot Officer P. S. Foss, to No. 7 (B.) Sqdn., Worthy Down, 20.1.34.

Acting Pilot Officers: R. M. Bradley, to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 17.1.34. B. J. Paul, to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 17.1.34.

Stores Branch

Squadron Leaders: P. F. Connaughton, to School of Store Accounting and Storekeeping, Cranwell, 22.1.34, for Stores duties, vice Flt. Lt. E. G. Keeping. F. E. J. Coates, to H.Q., Fighting Area, 1.2.34, for Equipment (Stores) Staff duties, vice Flt. Lt. B. E. Essex.

Flight Lieutenants: L. H. Hillier, to Station H.Q., Upper Heyford, 26.1.34. E. G. Keeping, to No. 3 Flying Training School, Grantham, 22.1.34. G. G. C. Pigott, to Station H.Q., Tangmere, 1.2.34.

Flying Officer K. N. Smith, to Aircraft Depot, India, Karachi, 25.1.34.

Accountant Branch

Flight Lieutenant S. C. George, to R.A.F. Base, Gosport, 31.1.34.

Medical Branch

Air Commodore A. V. J. Richardson, O.B.E., to H.Q., Air Defence of Great Britain, Uxbridge, 30.1.34, for duty as Principal Med. Officer, vice A/Cdre. H. V. Wells, C.B.E.

Wing Commanders: A. S. Glynn, to H.Q., Iraq Command, Hinaidi, 20.1.34, for duty as Principal Medical Officer. R. H. Knowles, to H.Q., Aden Command, 20.1.34, for duty as Principal Med. Officer.

Squadron Leader J. G. Russell, to Air Ministry Dept., of A.M.P. (D.M.S.), 1.2.34, for Med. Staff duties, vice Sqd. Ldr. D. G. Boddie.

Flight Lieutenants: A. F. Cook, to School of Tech. Training (Apps.), Halton, 29.1.34. C. Crowley, to Station H.Q., Andover, 25.1.34. E. A. Gudgeon, to Station H.Q., North Weald, 22.1.34.

Flying Officer (Medical Quartermaster) T. H. Harding, to Princess Mary's R.A.F. Hospital, Halton, 26.1.34, on appointment to a permanent commn.



RUGBY: ROYAL NAVY v. ROYAL AIR FORCE

THE Royal Navy beat the Royal Air Force at Twickenham on February 10 by 5 goals (1 dropped) and 4 tries = 36 points, to nil.

This was an amazing match, but it was very poor Rugby, and the very large crowd which did not come to Twickenham to see it showed good judgment. Seldom has there been a smaller attendance at a Services match, and seldom has there been a larger score. There were other unusual features. For one thing, the Navy XV included only three Executive Officers. It was otherwise composed of Engineer Officers, a Paymaster, a Schoolmaster, three Midshipmen, an Engine Room Artificer, a Marine and three Able Seamen. There was only one International on the field, F/O. C. R. Davies of Wales. Another feature of the match was the referee, Mr. J. R. Paterson, of Scotland, who was prominent in the red blazer of Loretto School. He awarded 18 free kicks during the match, 10 to the R.A.F. and 8 to the R.N., but he was very loath to order a scrum and usually let the mauls work themselves out.

After such a score as 36 to nil, the critic is obliged to ask whether the winners were superlatively good or the losers very bad. Unfortunately in this case the answer must be that the enormous Navy score was chiefly due to the deplorable tackling of the R.A.F. back division. They simply would not go hard and low at their men. They just pawed at their shoulders, with the natural result. The Navy attack did not appear to be of that class which would make much impression on an average sound defence. They will probably look quite ineffective when opposed to the Army. But on Saturday they realised the situation and played up to it. They soon found that when an Air Force defender patted their shoulder, all they need do was to give a good shake, run on, and score a try. Once you realised that there was no defence worth the name on the field, it was quite easy to put up a big score. Some of their scores were quite pretty, none the less, especially the second one, when any number of players handled before Lt. Hammond crossed the line. Both the tries by Schoolmaster Tarr were spirited bits of work; while the great run by Midshipman Kirkby in the second half was a mixture of the glorious and the ridiculous. Great praise is due to the two A.B.'s, Knapman and Bailey, who played in the centre of the R.N. third line, and Knapman in particular played a splendid game.

The R.A.F. were handicapped by the absence of C. Beamish, Mermagen, Constantine and Coote, and these losses probably hit them harder than the absence of Elliott and Forrest (playing for England at Dublin) hit the Navy. The R.A.F. forwards played hard, as usual, but their duel with the Navy eight was a draw. Elsmie did his very best at the base of the scrum, Le Good made some determined runs, and McKern played a sound game at full back. But unless a team can tackle hard and low, it deserves all that it gets.

The teams were

ROYAL NAVY.—Lt. C. G. Gosling (H.M.S. *Drake*); Midsh. P. D. Lewis (R.N.E. College, Keyham), A/B J. H. Bailey (H.M.S. *Drake*), A/B C. R. Knapman (H.M.S. *Drake*), Midsh. J. P. Kirkby (R.N.E. College, Keyham); Sub/Lt. J. S. W. Walsham (H.M.S. *Iron Duke*), Midsh. G. H. Hunter (R.N.E. College, Keyham); Engineer Art. H. S. Doggett (H.M.S. *Hermes*), Schoolmaster D. J. Tarr (H.M.S. *Vincent*), Marine E. Light (R.M. Barracks, Plymouth), A/B Attwood (H.M.S. *Vivid*), Lt./Cmdr. T. G. P. Crick (H.M.S. *Drake*) (capt.), Pay./Sub/Lt. J. K. Watkins (H.M.S. *Drake*), Sub/Lt. R. J. H. Stephens (H.M.S. *Curacoa*), and Lt. R. J. L. Hammond (H.M.S. *Durban*).

ROYAL AIR FORCE.—F/O R. N. McKern (Tangmere); F/O H. J. F. Le Good (Abingdon), P/O T. I. Davies (Grantham), P/O D. Finlay (Northolt); F/O J. G. Llewellyn (Grantham), F/O G. R. A. Elsmie (Hendon); Sgt. J. S. Signal (Duxford), F/O G. E. Valentine (Netheravon), P/O R. H. Waterhouse (Sealand), Sgt. C. G. R. Lewis (Upper Heyford), F/O Murphy (Wittering), F/O C. R. Davies (Cardington), Flt./Lt. C. J. S. O'Malley (Halton), and P/O R. H. S. McConnell (Sealand).

F. A. DE V. R.

Examination of Applicants for Ground Engineers' Licences or Extension to the Scope of Existing Licences

THE Air Ministry announces:—Examination Boards will sit for the purpose of examining applicants for ground engineers' licences at the following places and times: (a) London, weekly, on each Tuesday in April, May and June, 1934; (b) Croydon, on the second Friday in April, May and June, 1934; (c) Manchester, on the first Friday in May, 1934; (d) Bristol, on the first Friday in April, 1934; (e) Glasgow, on the third Thursday in April, 1934.

Applications for licences should be made on C.A. Form 2B, which is obtainable on request, and should be addressed to The Secretary, Air Ministry (C.A.2), Adastral House, Kingsway, London, W.C.2. Applications for extensions to existing licences will also be dealt with at these boards, and such applications should be made on C.A. Form 2D to the above address. When forwarding the application, the applicant should indicate the provincial centre which he wishes to attend for examination, if he is unable to take the examination in London.

Application for examination at the centres named at 1 (c), (d), and (e) above can only be accepted provided that the application, together with the appropriate fees, is received 28 days before the dates specified, and provided also that the total number of applications received is within the capacity of the board. Applicants whose applications are not accepted owing to these provisions will be given the opportunity of early examination in London, or, alternatively, of being placed on a waiting list for the next board to be held in the place in question.

BRIEFLY

Italian Tribute for British Oil.—Signori Lombardi and Mazzotti, the pilots of the Italian monoplane in the recent air mail flight across the South Atlantic from Senegal to Brazil, have cabled from Ceara to the Wakefield Company in London as follows:—At every landing we had wonderful assistance from your agents, and Castrol perfect even at high temperatures. Many thanks, best wishes.—Lombardi, Mazzotti.

Benzole at B.I.F.—The National Benzole Company are exhibiting in the Birmingham Section of the British Industries Fair a working model showing the production of benzole from coal mine to carburetter. National benzole is a by-product of coal and is produced at coke ovens and gas works throughout the country.

Air Transport & Sales, Ltd.—Mr. Gerald Farquharson has joined the Board of Air Transport & Sales, Ltd., as a Director in place of Mr. Peacock who has gone abroad. The company will be operating again at Hayling this year, but at the moment are concentrating on sales in London. Their temporary office is 19, Denman Street, Piccadilly. Telephone Paddington 8936.

A Good Understanding.—Dowty mechanically damped shock absorber undercarriage struts are now standard on the D.H.86, the latest "Dragon," and also the standard and "Tiger Moths."

From Brooklands to Brum.—Mr. George Lowdell has left the Brooklands School of Flying, where he has instructed for nearly four years, to join Wolseley Motors, Ltd., as Chief Test Pilot. Three Hawker "Tomtits," which Mr. Lowdell will use, are soon to be taken from Brooklands to Castle Bromwich. It may be remembered that Mr. Lowdell flew a "Tomtit" fitted with a Wolseley engine in the King's Cup Race last year.

Brico Piston Rings.—The British Piston Ring Co., Ltd., of Coventry, has just issued its Catalogue and Directory for 1934. The book contains details of piston rings for the engines of motor-cars, motor-cycles, commercial vehicles, tractors and steam vehicles of all descriptions. It should prove worth its weight in gold to the man who fits piston rings.

The British Industries Fair, 1934

FROM February 19 to March 2 the twentieth British Industries Fair will be held at Olympia and White City, London, and at Castle Bromwich, Birmingham. The Fair this year should break all records for size, scope and variety. It is claimed, in fact, that it will be the largest and most comprehensive display of the industrial products of the British Commonwealth of Nations ever brought together at a trade show. At the first Fair in 1915 there were about five miles of stands; this year there will be fully 32 miles of indoor stands alone.

The Birmingham section of the Fair should be of the greatest interest to those connected with aviation, and the following are some of the better known firms who will be exhibiting:—Anglo American Oil Co., Ltd.; Bakelite, Ltd.; Britannia Batteries, Ltd.; British Thomson-Houston Co., Ltd.; Exide & Drydex Batteries; Joseph Lucas, Ltd.; Accles & Pollock, Ltd.; British Oxygen Co.; Colas Products, Ltd.; Dunlop Rubber Co., Ltd.; Imperial Chemical Industries, Ltd. (Degreasing Department); David Moseley & Sons, Ltd.; National Benzole Co., Ltd.; Reynolds Tube Co., Ltd.; Rotherham & Sons, Ltd.; Rubery Owen & Co.; Serck Radiators, Ltd.; Tecalemit, Ltd.; United Steel Companies, Ltd.; Vacuum Oil Co., Ltd., and Wellworthy, Ltd.

Rolls-Royce bonus shares

THE following is an extract from remarks made by Lord Wargrave, the Chairman of Rolls-Royce, at the Extraordinary General Meeting held on October 16, 1933:—"A statement appears to have been circulated that Bonus Shares are to be issued. I can only say for your information that no such intention is in the minds of the Directors, and no such proposal has been considered by them. There are no Bonus Shares, and there is no authority to say that there is likely to be such a distribution." Mr. A. F. Sidgreaves, the Managing Director, has been authorised to confirm this statement, and to add that nothing has occurred in the meantime to alter it.



EASY TO HANDLE: By means of this wheelbarrow-pump Adcol lubricating oil is now supplied direct from ten gallon drums at most aerodromes. Here, it is filling up one of Airwork's Avro "Cadets" at Heston.

PUBLICATIONS RECEIVED

An Introduction to Aeronautical Engineering. Vol. I. Mechanics of Flight. 2nd Edition. By A. C. Kermode. London: Sir Isaac Pitman & Sons, Ltd. Price 8s. 6d. net.

L'Effort d'Hispano Suiza en 1933. Société Française Hispano-Suiza, rue Capitaine Guynemer, Bois-Colombes, France.

Mexico. Naval Air Pilot, H.O. No. 193. United States Government Printing Office, Washington, D.C., U.S.A. Price 60 cents.

Selection and Fitting of Piston Rings. The British Piston Ring Co., Ltd., Holbrook Lane, Coventry.

The Leipzig Spring Fair, 1934. Thomas Cook & Son, Ltd., Berkeley Street, London, W.1.

The South American Handbook, 1934. London: Trade & Travel Publications, Ltd. Price 2s. 6d. net.

NEW COMPANIES REGISTERED

MODEL TRANSPORT CO., LTD., 22, Brooks Mews, Westminster, S.W.1.—Capital, £500 in £1 shares. Acquiring the business now carried on at The Corner House, Cowley Street, Westminster, as "The Model Transport Co." manufacturers of and dealers in aircraft models, models of cars, engines and other means of transport, etc. Directors: Miss Rosalind Norman, The Corner House, Cowley Street, Westminster, S.W., and Henry D. Niven, Boodles Club, St. James's, S.W. (director of Niven Huntley & Co., Ltd.) The said Rosalind Norman shall be permanent chairman and governing director so long as she holds £100 shares.

LONDON, SCOTTISH & PROVINCIAL AIRWAYS, LTD., Terminal House, 52, Grosvenor Gardens, S.W.1.—Capital, £100 in £1 shares. Aerial transporters of passengers, merchandise, mails, and other goods; to arrange establish and maintain services by air, etc. First directors:—Stanley Bell, White Barn, Brookwood, Surrey, engineer, Lionel K. Lund, 9, Magnet House, Paddington, W.

ALTIGRAPH, LTD.—Capital £500, in £1 shares. Acquiring the business of the Altigraph Aerial Photography Services heretofore carried on by Wm. F. Davison and Elsie J. Davison at Central Chambers, Ellesmere Port, and to carry on aerial photography and aerial survey work, map, plan, atlas and globe producers and makers, colourers and mounters, etc. Directors: Wm. F. Davison and Elsie J. Davison, 1, Bachelor's Lane, Chester. Solicitor: Geo. Wallace, Post Office Chambers, Ellesmere Port.

INCREASE OF CAPITAL

BRITISH KLEMM AEROPLANE CO., LTD., Hanworth Aerodrome, Victoria Road, Feltham, Middlesex.—The nominal capital has been increased by the addition of £6,500 in £1 ordinary shares beyond the registered capital of £13,500.

PATENT AERONAUTICAL SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1932

Published February 15, 1934

- 10,328. BENDIX AVIATION CORPORATION. Wireless receiving apparatus. (404,659.)
- 13,564. C. H. A. F. L. ROSS. Screw-propeller blades and the like. (404,631.)
- 29,145. WHITEHEAD TORPEDO CO., LTD., and A. E. JONES. Devices for carrying torpedoes on, and releasing them from aircraft. (404,775.)

APPLIED FOR IN 1933

Published February 15, 1934

- 5,194. W. A. LOTH and S. M. GUYOT. Apparatus provided with dynamic lifting-surfaces or with dynamic lifting-propelling-surfaces. (404,817.)